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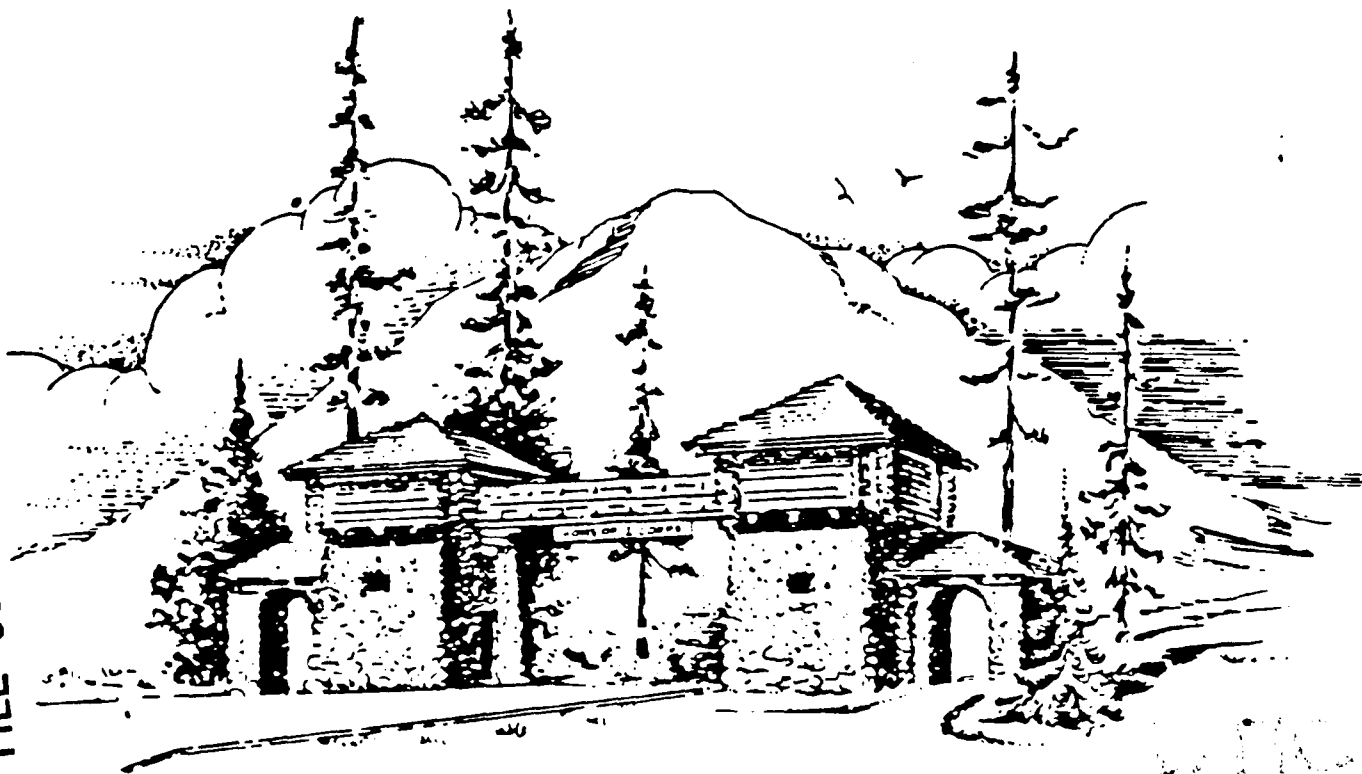
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Economic Analysis of Family Housing at Fort Lewis, Washington

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A study to determine the most effective means of providing adequate military family housing for 250 junior and senior noncommissioned officers and to determine if onpost and offpost build to lease options are viable alternatives with particular emphasis on the reversionary clauses under which land not used for military purpose reverts back to Pierce County. Alternatives examined were <u>Build-to-lease-housing</u> , <u>MCA housing</u> , <u>Rental guarantee housing</u> , <u>Payment of allowances</u> .			

EXECUTIVE SUMMARY

This Economic and Sensitivity Analysis of Alternatives for Providing Family Housing at Fort Lewis, Washington, was conducted in response to a request from the Fort Lewis Director of Engineering and Housing. The decision objectives of this study were twofold: to determine the most effective means of providing adequate military family housing for 250 junior and senior noncommissioned officers at Fort Lewis and to determine if onpost and offpost build to lease options are viable alternatives with particular emphasis on the reversionary clauses under which land not used for military purpose reverts back to Pierce County.

A wide range of alternatives were examined to address the study objectives. In evaluating these alternatives, legal, financial, policy, social, and economic criteria were considered. Six alternatives were analyzed in this study:

a. Build to lease housing (three alternatives) where a contractor would construct and maintain units either onpost or offpost. Three build to lease alternatives were examined:

(1) Location onpost with provisions (and costs) for demolition at the end of the 20-year lease.

(2) Location onpost without demolition; Government exercising option to procure units at the end of the 20-year lease.

(3) Location offpost.

Occupants would forfeit their BAQ and VHA allowances in return for assigned quarters. Guidelines specified in Section 801 of the Military Authorization Act of 1984 were followed in the analysis.

b. MCA housing would involve Government construction, maintenance, and operation of units on Fort Lewis. Occupants would forfeit their BAQ and VHA allowances in return for assigned quarters.

c. Rental guarantee housing would entail construction, maintenance, and operation of offpost dwelling units by a private contractor. Section 802 of the above mentioned act was used as a guideline for the analysis. Occupants would receive housing allowances and pay their own rent plus utilities.

d. Payment of allowances can be viewed as the do nothing alternative. Participants would receive housing allowances and pay their own rent plus utilities for housing units independently obtained in the local economy.

A review of the legal issues concerning Pierce County's reversionary land provisions of the Fort Lewis deed concluded that the onpost build to lease option was a viable alternative if occupancy of the housing was limited to families of members of the armed forces. The ground lease could run for more than 20 years, but a firm commitment could only be given for a 20-year period.

On the basis of cost to the Federal Government, the analysis revealed that over the 20-year study period the least costly alternative would be the continued payment of allowances with a total estimated present worth cost of \$9.5 million, followed by the rental guarantee program (\$9.7 million), MCA construction (\$20.6 million), build to lease offpost (\$25.2 million), build to lease onpost (\$25.7 million), and build to lease onpost with demolition (\$26.0 million). Payment of allowances is not considered a viable solution due to the shortage of suitable rental housing in the area. The viability of the rental guarantee alternative has also come into question as developers are reportedly reluctant to accept the conditions of the current 802 program.

Examination of the direct cost to the Government should not be the sole criterion used in evaluating the alternatives. Additional costs and other nonquantifiable considerations affecting military personnel and their families such as driving time and expense, personal housing expense, support service availability, and community cohesiveness should also be considered. On the basis of cost to the Federal Government, the rental guarantee program may be viewed as the least expensive alternative disregarding other quality of life considerations, with MCA construction the next best alternative. In terms of personal expense and nonquantifiable quality of life impacts to the soldier, MCA construction and the onpost build to lease alternatives are preferred.

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AN ECONOMIC AND SENSITIVITY ANALYSIS OF ALTERNATIVES
FOR PROVIDING FAMILY HOUSING AT
FORT LEWIS, WASHINGTON

Prepared by
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SECTION 1. INTRODUCTION

1.01. The Decision Objective. The decision objectives of this study were to determine the most effective means of providing adequate military family housing for 250 junior and senior noncommissioned officers at Fort Lewis, Washington, and to determine if onpost build to lease alternative is a viable option given existing deed restrictions.

1.02. Major Assumptions.

a. Present value calculations utilized a discount rate of 10 percent (per Army Regulation 11-28).

b. All costs estimated in Fiscal Year (FY) 1986 prices (constant dollars). Future cost increases due to inflation were not included in this analysis.

c. Basic allowance for quarters (BAQ) and variable housing allowance (VHA) calculated at "with dependents" rate.

d. Structure life for new construction was assumed to be 40 years (per DA Pam 210-YY2).

e. Maintenance, repair, and services costs comparable to existing onpost housing.

f. Utilities costs offpost would be approximately 10 percent more expensive than onpost due to higher electricity costs.

g. Lease rental costs equal amortization plus interest cost, over 20 years, for total investment costs.

h. The cost element common to all alternatives, routine administration costs, was excluded from the analysis.

i. The analysis period for the study was 20 years (FY 1986 to FY 2005, inclusive).

1.03. Alternative Courses of Action. Six potential housing alternatives were analyzed in this study:

a. Build to lease housing where a private contractor would build and maintain 250 single-family dwelling units either onpost or offpost. Three build to lease alternatives were examined: (1) location onpost with provisions (and costs) for demolition at the end of the 20-year lease period included in the lease; (2) location onpost without demolition, Government exercising option to procure units at the end of 20 years; and (3) location offpost. Onpost a developer must plan to either demolish the housing and return the land to its natural state or to sell the development to the Government at the end of the 20-year lease. Offpost a developer would lease to the Government for 20 years

and then arrange for a future use. Major provisions outlined in Section 801 of the Military Authorization Act of 1984 were followed in analyzing these alternatives (appendix C contains a copy of the legislation). The study period of 20 years was selected based upon the longest allowable lease contract under the present law. Occupants would forfeit their BAQ and VHA allowances in return for assigned quarters. Cost to the Government would be all direct costs associated with the housing plus the lease cost.

The reversionary clause in the conveyance by Pierce County was examined and found not to prohibit 801 housing on Fort Lewis (appendix B). The Government could not sell to a developer, but could offer a ground lease for the site of a housing project onpost at no charge. The lease could be for a firm term up to 20 years, but the Secretary would have the right to revoke the lease at any time after the 20-year period. The housing units could be occupied only by military families.

Due to the high degree of uncertainty surrounding a developers' profit and tax expectations as applied to the build to lease program, the Office of the Chief of Engineers (OCE) advised against providing a quantified cost estimate. In an attempt to provide some general cost information, however, we have made a "best guess" estimate based on professional judgment. We expect the uniform annual cost calculations to differ from a developer's proposal, perhaps to the extent that the final ranking of alternatives would change. Our estimate should therefore be used cautiously.

b. MCA housing would involve Government construction, maintenance, and operation of 250 single-family dwelling units on Fort Lewis. These units would be built over 2 years, 1 January 1986 to 1 January 1988. Vacant developable land is available onpost at Fort Lewis for this expansion per the installation master plan. The Beechwood area was specified as the most likely site for construction. Cost to the Government would be all direct costs associated with this housing.

c. Rental guarantee housing would entail construction, maintenance, and operation of 250 single-family dwelling units either onpost or offpost by a private contractor. Guidelines specified in Section 802 of the above mentioned act were followed (appendix C contains a copy of the legislation). One exception was made: the contract was assumed to cover 20 years (rather than the statutory 15 years). Contract cost was assumed constant over 20 years. The Government would guarantee the contractor 97 percent occupancy, with occupants leasing directly from the contractor. Occupants would receive BAQ and VHA stipends but would be required to pay their own rent plus utilities. Any housing costs above and beyond the allowances would be paid by the service member. Cost to the Government would be allowance payments plus contract administration costs.

This alternative was examined mainly for comparative purposes. The cost estimate indicates the prospective cost to the Government should a developer agree to participate in this program. Certain other Army installations have found developers unwilling to meet the requirements of the current law. In particular, new housing must be constructed to Department of Defense (DOD) specifications, yet rental rates are limited to market rates for rental dwelling units in the same general market area.

d. Payment of Allowances for housing on the local economy. This would involve payment of BAQ and VHA allowances to the individual service members. Housing would be independently obtained by the service member in the local area. Housing costs which exceeded the allowances would be paid by the service personnel. Cost to the Government would be the allowance payments.

This alternative was examined for comparative purposes, given that it is not considered a viable option. This analysis confirms that insufficient housing exists on the local economy (see appendix D).

1.04 Economic Analysis Results. This analysis revealed that the least costly, viable Army family housing alternative would be rental guarantee with a total estimated present worth cost of \$9.7 million. It is doubtful, however, whether a developer would accept this program. The next least costly alternative is MCA construction with an estimated present worth cost of \$20.6 million. The cost of the build to lease program (offpost) was tentatively placed at \$25.2 million; build to lease onpost would cost \$25.7 million, and build to lease onpost with demolition would cost \$26 million. The present worth costs and average annual equivalent values of all alternatives are shown in table 1-1. Figure 1-1 provides a graph of the net cumulative present value of expenditures.

TABLE 1-1

SUMMARY OF GOVERNMENT COSTS FOR ECONOMIC ANALYSIS

<u>Alternative</u>	<u>Total Present Worth Cost (in \$1,000's)</u>	<u>Average Annual Equivalent Cost ^{1/} (in \$1,000's)</u>
Allowances	\$9,536 ^{2/}	\$1,120 ^{2/}
Rent Guarantee (802 Program)	9,660 ^{2/}	1,135 ^{2/}
MCA Construction	20,558	2,415
Build to Lease (801 Program) (Offpost)	25,196	2,960
Build to Lease (801 Program) (Onpost)	25,738	3,023
Build to Lease (801 Program) (Onpost, With Demolition)	25,961	3,049

^{1/}Based on a 20-year period of analysis and 10 percent discount rate.

^{2/}Represents costs to Government only. See section 2.07 for personal expenses.

1.05 Additional Decision Critieria. In addition to costs to the Government, each housing alternative would have additional costs to the military personnel occupying the housing units which must also be considered. Table 1-2 illustrates the benefits of the onpost alternatives compared to offpost housing. Driving time/expense, personal housing expense, support service availability, and community cohesiveness would all be positively affected by living onpost. These same factors would all be negatively impacted by living offpost (with the exception of personal housing expenses in the BTL-Off alternative).

TABLE 1-2
ADDITIONAL DECISION CRITERIA

	<u>MCA</u>	<u>BTL ON-DEMO</u>	<u>BTL ON</u>	<u>BTL OFF</u>	<u>802</u>	<u>ALLOWANCES</u>
1. Driving Time/Expense	+	+	+	-	-	-
2. Personal Housing Expense ¹ /	+	+	+	+	-	-
3. Support Service Availability	+	+	+	-	-	-
4. Community Cohesiveness	+	+	+	-	-	-

KEY: + Positive Factor
- Negative Factor

¹/Based on average allowance payments compared to average rental costs.

TABLE 2-6
AVERAGE ANNUAL EQUIVALENT COST
FOR ALTERNATIVE PROJECT SIZES 1/
(in \$1,000's)

<u>Alternative</u>	<u>200 Units</u>	<u>250 Units</u>	<u>300 Units</u>
Allowances	896	1,120	1,349
Rental Guarantee (802)	908	1,135	1,367
New Construction (MCA)	1,932	2,415	2,910
BTL Offpost	2,368	2,960	3,564
BTL Onpost	2,418	3,023	3,640
BTL Onpost, w/Demolition	2,439	3,049	3,671

1/ Cost estimates for 200 and 300 units based on simple mathematical adjustment from known costs for 250 units:

$$\begin{aligned}\text{Cost (200 units)} &= \text{Cost (250 units)} \times .80 \\ \text{Cost (300 units)} &= \text{Cost (250 units)} \times 1.204\end{aligned}$$

2.07 Sensitivity Analysis - Non-Government Cost Items. Examination of the direct cost to Government did not provide a complete comparison of the housing alternatives. Important additional issues were either non-quantifiable or costs incurred by service personnel. Table 2-5 schematizes the impact of the various alternatives upon additional decision criteria. For example, under the MCA and two BTL onpost alternatives, there would be very little driving time and expense, whereas location offpost under the BTL-Off, 802, and allowances alternative would impose additional costs upon service members.

a. Driving Time/Expense. Construction of housing onpost would result in lower driving costs for service personnel than would the offpost alternatives. Onpost housing would also reduce the hazard of driving in winter weather conditions. Estimated costs for commuting to Fort Lewis would depend primarily upon driving distance to the post. Figure 2-2 indicates that one could expect commuting costs to vary from \$150 to \$600/month. Figure 2-3 provides a local map indicating commuting distances and times to Fort Lewis. In terms of quality of life, living onpost would also reduce the time spent driving, thus freeing time for other pursuits.

TABLE 2-5

SENSITIVITY OF COST ELEMENTS

<u>Cost Element</u>	<u>Required Change</u>	
	<u>Least Cost</u>	<u>Below MCA</u>
<u>Build To Lease (Onpost, With Demolition)</u>		
Lease Cost	-78 Percent	-26 Percent
Utilities, Services, M&R	Insensitive ^{1/}	Insensitive
Contract Administration	Insensitive	Insensitive
<u>Build To Lease (Onpost, Without Demolition)</u>		
Lease Cost	-78 Percent	-25 Percent
Utilities, Services, M&R	Insensitive	Insensitive
Contract Administration	Insensitive	Insensitive
<u>Build To Lease (Offpost)</u>		
Lease Cost	-78 Percent	-23 Percent
Utilities, Services, M&R	Insensitive	Insensitive
Contract Administration	Insensitive	Insensitive
<u>New Construction Alternative (MCA)</u>		
Construction Cost	-70 Percent	--
Utilities, Services, M&R	Insensitive ^{1/}	--
<u>Rental Guarantee</u>		
BAQ+VHA	Insensitive	--
Contract Administration	Insensitive	--

^{1/}Cost element decreases of more than 100 percent would be necessary to alter the outcome of these tests.

Changes in the size of the project would also affect the cost of each alternative. Additional detailed complete analyses were not performed, but representative costs for both 200 and 300 unit projects were computed in table 2-4. The ranking of alternatives remained constant for all project sizes. Compared to a 250-unit project, the difference in cost between alternatives became less with a smaller project, and greater with a larger project. Cost items would, therefore, be more sensitive in a 200-unit project and less sensitive in a 300-unit project.

TABLE 2-4 (con.)

<u>Alternative</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
BTL-On-Demo	\$23,848,349	\$24,454,211	\$25,004,995
BTL-On	23,643,210	24,243,884	24,789,952
BTL-Off	23,143,240	23,732,087	24,267,402
New Construction	20,163,490	20,276,578	20,379,386
Guarantee (802)	8,876,790	9,101,265	9,305,333
Allowances	8,763,553	8,985,165	9,186,630

<u>Alternative</u>	<u>FY 2004</u>	<u>FY 2005</u>
BTL-On-Demo	\$25,505,707	\$25,960,900
BTL-On	25,286,377	25,737,673
BTL-Off	24,754,052	25,196,462
New Construction	20,472,847	20,557,812
Guarantee (802)	9,490,850	9,659,501
Allowances	9,369,779	9,536,279

2.06 Sensitivity Analysis - Government Cost Items. This economic analysis provides a ranking of total costs for the six housing alternatives. The total cost of each alternative is comprised of a number of cost elements unique to that alternative. The analysis required certain assumptions and some judgment to be applied in the development of estimated costs for the various expense elements. If slight changes in a particular cost item would alter the ranking of the six alternatives, the analysis is said to be "sensitive" to that cost variable. Accordingly, sensitivity tests were performed to determine what changes in each cost element would be required to produce a different ranking of the alternatives. This helps to indicate how confident one may be with the results. The results of these tests are presented in table 1-3 (the second column indicates the cost change necessary to make an alternative the least cost alternative, the third column indicates the cost change necessary to make an alternative lower cost than the MCA alternative). In this study, for example, the lease cost must decline 78 percent for the build to lease alternative (onpost, with demolition) to become the lowest cost alternative, and decline 26 percent to rank lower than the MCA alternative. Due to the mathematical nature of these tests, large cost items are always more sensitive than small cost items for each alternative. Only the three lease cost and the MCA construction cost variables were found capable of influencing the ranking with changes under 100 percent. Given the cost components which comprised each alternative, changes in other variables usually affected several alternatives simultaneously, which made it impossible to alter the rankings.

TABLE 2-4

SUMMARY OF CALCULATION RESULTS
NET DISCOUNTED PRESENT VALUE

<u>Alternative</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>
BTL-On-Demo	\$3,266,086	\$5,884,901	\$7,994,574
BTL-On	3,242,249	5,839,394	7,929,369
BTL-Off	3,165,972	5,704,176	7,748,447
New Construction	3,713,449	14,892,797	17,602,285
Guarantee (802)	1,031,455	1,959,142	2,821,585
Allowances	1,018,298	1,944,023	2,785,592

<u>Alternative</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991</u>
BTL-On-Demo	\$9,927,145	\$11,684,679	\$13,285,396
BTL-On	9,844,030	11,585,283	13,171,201
BTL-Off	9,622,277	11,326,410	12,878,582
New Construction	17,833,666	18,044,664	18,239,440
Guarantee (802)	3,596,533	4,301,032	4,941,484
Allowances	3,550,654	4,246,165	4,878,448

<u>Alternative</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994</u>
BTL-On-Demo	\$14,799,797	\$16,226,920	\$17,525,640
BTL-On	14,672,146	16,087,037	17,374,637
BTL-Off	14,348,849	15,735,852	16,998,098
New Construction	18,475,711	18,740,899	18,983,314
Guarantee (802)	5,523,714	6,053,014	6,534,196
Allowances	5,453,251	5,975,799	6,450,842

<u>Alternative</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>FY 1997</u>
BTL-On-Demo	\$18,706,294	\$19,779,615	\$20,755,362
BTL-On	18,545,182	19,609,313	20,576,706
BTL-Off	18,145,594	19,188,773	20,137,117
New Construction	19,203,691	19,404,033	19,586,163
Guarantee (802)	6,971,634	7,369,305	7,730,824
Allowances	6,882,700	7,275,298	7,632,205

<u>Alternative</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
BTL-On-Demo	\$21,642,405	\$22,448,807	\$23,181,901
BTL-On	21,456,153	22,255,651	22,982,467
BTL-Off	20,999,248	21,783,003	22,495,508
New Construction	19,751,735	19,902,256	20,039,093
Guarantee (802)	8,059,477	8,358,253	8,629,868
Allowances	7,956,667	8,251,631	8,519,781

TABLE 2-3

MATRIX OF GOVERNMENT COST ELEMENTS

Variable Number	Cost Category	New Construction	BTL		BTL Offpost	Rental Guarantee (802)	Economy Housing
			Onpost With Demo	Onpost Without Demo			
1	Construction (MCA)	X					
2	BTL Lease (On, Demo)		X				
3	BTL Lease (On, W/O Demo)			X			
4	BTL Lease (Off)				X		
5	BAQ/VHA (802, Econ)					X	X
6	BAQ/VHA (MCA, BTL)	X	X	X	X		
7	Maintenance & Repair (MCA, BTL)	X	X	X	X		
8	Utilities (MCA, BTL-On)	X	X	X			
9	Utilities (BTL-Off)				X		
10	Services (MCA, BTL)	X	X	X	X		
11	Contract Admin (BTL, 802)		X	X	X	X	

d. Assumptions - (MCA) New Construction.

(1) A structure life of 40 years was used for calculation of the residual value of the new structures.

(2) The loan amortization method was used to calculate the residual value (see appendix E).

(3) All units used the maximum allowable square footage:

o 23 units for senior noncommissioned officers (NCO) (E9-E7) = 1,450 square feet.

o 227 units for junior NCO (E6-E4) = 950 square feet.

(4) No cost to the Federal Government for land.

(5) M&R, utilities, and services costs approximate existing onpost housing. Costs phased in according to month of occupancy. No M&R costs in year 1 for each unit. Maintenance costs begin year 2. Major repair costs begin in year 6.

(6) Construction costs phased in according to year in which units available for occupancy.

e. Assumptions - (802) Rent Guarantee.

(1) Government contract renewed after 15 years (statutory limit). Cost constant for 20-year project life.

(2) Contract administration cost equals approximately one GS-5 salary per year. Costs begin at the start of FY 1986.

2.05 Summary of Government Costs. Six alternatives for providing adequate housing were analyzed in this study: build to lease program (801) onpost with demolition, build to lease program (801) onpost without demolition, build to lease program (801) offpost, MCA construction, rental guarantee program (802), and payment of allowances. The cost categories included in calculating the net present values of each alternative are summarized in table 2-3. Table 2-4 summarizes the calculation of cumulative net discounted present values over the 20-year period of analysis (this data was used to plot figure 1-1).

TABLE 2-2

BUILD TO LEASE ASSUMPTIONS

	<u>BTL ON DEMO</u>	<u>BTL ON</u>	<u>BTL OFF</u>
(1) Lease rental cost based upon:			
o 20-year loan, complete repayment	X	X	
o 30-year loan, partial repayment <u>1/</u>			X
o 227 units of 1,450 square feet, 23 units of 950 square feet	X	X	X
o excludes tax considerations	X	X	X
o excludes property management profit	X	X	X
o includes 10 percent cost reduction on private sector construction costs below Government construction costs (less bureau- cracy, can use nonunion labor)	X	X	X
o includes 13 percent interest cost on 100 percent borrowed funds	X	X	X
o includes land cost based on local market value for residential subdivision land in Pierce and Thurston Counties			X
(2) Contract administration cost equals approximately one GS-5 salary/year begin- ning at start of FY 1986	X	X	X
(3) Maintenance and repair (M&R), utilities, and service costs approximate existing onpost housing. Cost phased in according to month of occupancy. No M&R costs in year 1; main- tenance costs begin in year 2; repair costs begin in year 6.	X	X	X

1/Under BLT-Off alternative, the structural life exceeds the life of the loan (40-year life, 30-year loan). In addition, the life of the loan exceeds the length of the lease (30-year, 20-year lease). Lease cost to Government under these conditions would be the I&A charge for the first 20 years of a 30-year loan.

(3) Changes in costs throughout the study due to inflation were excluded from the analysis. Input cost elements reflect estimated FY 1986 prices levels. Cost estimates initially based on non-FY 1986 price levels were converted to FY 1986 prices using inflation rate guidelines detailed in appendix E. A review of inflation guidelines indicated that the same escalation rate was applicable to all cost items and, therefore, differential inflation was not appropriate for this analysis. Inflation guidelines were from Department of Army, Program Budget Committee, based on OMB economic assumptions and pricing guidance (DACS-PBC Memorandum 84-164, dated 19 April 1984). These guidelines are similar to those contained in DAEN-ECE-S EIRS Bulletin 84-01, dated 1 May 1984.

(4) For purposes of calculating the residual value of housing structures at the end of a selected period of analysis, the structural life for new construction was taken to be 40 years. This residual value was computed using the loan amortization schedule for remaining principle at 10 percent interest. Residual value calculations applied only to the MCA new construction alternative. Residual values were not applied to any of the build to lease, rental guarantee, or allowances alternatives. This was because a developer would own the rights to the residual value of the leased/rented units rather than the Government under these programs.

(5) BAQ/VHA rates were for personnel "with dependents". Allowances were, therefore, slightly higher than if rates "without dependents" had been used.

(6) The cost item common to all alternatives, routine administration costs, was excluded from the cost comparison. Since this study focuses upon variations in cost among alternatives, inclusion or exclusion of common costs would not affect the results. For clarity they have been omitted.

(7) Under the build to lease and MCA alternatives, all units used the maximum allowable square footage:^{1/}

- o 23 units for senior noncommissioned officers (NCO) (E-9 to E-7)
= 1,450 square feet.

- o 227 units for junior NCO (E-6 to E-4) = 950 square feet.

(8) Calculations based upon 250 units of housing. The Sensitivity Analysis-Cost Items section of this report examined cost impacts due to project size.

c. Assumptions - (801) Build To Lease. Table 2-2 provides a matrix of assumptions utilized in the three build to lease alternatives. Under all options, lease rental costs were calculated to provide an income stream to the developer sufficient to cover the interest and amortization charge for total investment costs.^{2/}

^{1/}AR 210-50, page I-1.

^{2/}While a developer would certainly plan to "profit" from this project, this analysis does not attempt to pinpoint what those gains would be nor under which financial category they would appear.

b. Employment and Fiscal Construction Impacts. Construction of 250 single-family dwelling units was expected to generate approximately \$4,316,000 in construction labor wages and employ an average of about 60 construction workers over the 2-year construction period. Since the majority of workers will reside within the study area, it can be expected that most of the income generated from the proposed project will also be expended locally. The employment and income generated by the project would have a positive influence on the local economies of Pierce and Thurston Counties. It would be particularly beneficial to the hard pressed construction industry where the November 1984 insured unemployment rate was 12.3 percent of the Pierce County construction labor force. This compares with a total civilian labor force insured unemployment rate of 10 percent for Pierce County and 8.7 percent for the State of Washington during the same period. Data for November 1984 (the latest figures available) showed 978 construction workers unemployed in Pierce County out of a labor force of 7,962. Employment data was not broken down by employment sector by the Employment Security Department for Thurston County, but total insured unemployment was 9.9 percent in November 1984 in the County. It was expected that construction within the study area would draw from the labor pools of both Pierce and Thurston Counties.

2.04 Methodology and Assumptions.

a. Methodology. An initial determination was made as to which expense items (expense to the Government) would apply to each alternative. The development of expense element estimates is detailed in appendix A of this report. Computer runs were made to determine the present value by year, cumulative present value per year, and cumulative present value net of residual per year for the alternative streams of future expenditures. The computer output displayed projected costs per year excluding inflationary effects (constant dollar analysis).

To complete the analysis, noncost items and costs which would be borne by service personnel rather than the Government were examined. The development of these items is detailed in the Sensitivity Analysis - Non-Government Cost Items section of this report.

Costs to the Government should not be the only criterion used to evaluate these housing alternatives. It is hoped that by presenting both cost and non-cost issues, a decisionmaker will be able to weigh all the impacts of a particular course of action.

b. Project Assumptions.

(1) A discount rate of 10 percent was used to determine present values of constant dollar expenditures.

(2) Discounting calculations for expenses were performed using the midyear convention.

TABLE 2-1

TOTAL HOUSING SUPPLY

	PIERCE COUNTY		THURSTON COUNTY	
	<u>Total Units</u>	<u>Vacancies</u>	<u>Total Units</u>	<u>Vacancies</u>
Single-Family	115,236	2,878 (2.5%)	30,917	704 (2.3%)
Multiple-Family	43,066	2,238 (5.2%)	9,679	369 (3.8%)
Mobile Home	<u>8,560</u>	<u>199 (2.3%)</u>	<u>4,347</u>	<u>50 (1.2%)</u>
TOTAL	166,862	5,315 (3.2%)	44,943	1,123 (2.5%)

Sources: Postal Survey data; Federal Home Loan Bank of Seattle, Seattle/Everett/Tacoma, Washington, Housing Vacancy Survey, March 1983; and Thurston Regional Planning Council, Thurston County Profile, July 1984, pp. IV-15.

In addition to quantitative issues, qualitative concerns should also be addressed. The BAQ plus VHA payments to service personnel were designed to cover approximately 85 percent of actual housing costs. In practice, housing allowances only cover between 75-85 percent.^{1/} Due in part to monetary considerations and in part to the convenience of living onpost, there were 1,282 enlisted personnel on a waiting list for housing as of 30 July 1984 (a wait of 3-9 months). The Sensitivity Analysis - Non-Government Cost Items portion of this report addresses certain reasons for preferring to live onpost.

2.03 Community Impact Analysis.

a. Impact on the Rental Housing Market. The addition of 250 housing units, whether built on or off Fort Lewis, is not expected to have a large impact on the current rental housing market in the study area - Pierce and Thurston Counties. Based on a July 1984 housing survey, there were 46,088 rental housing units in Pierce County and 15,687 units in Thurston County, for a total of 61,778 rental units. The addition of 250 units would represent only 0.5 percent of the total rental units currently located in Pierce County, 1.6 percent of those in Thurston County, and 0.4 percent in the combined two county area. This small increase in available rental housing units was not expected to influence prevailing rents in the study area.

^{1/}Telephone discussion with Major G. Ross, OCE, Army Housing Management Division, 12 December 1984.

2.02 Housing Requirements. The addition of new housing units to the existing supply was predicated upon an existing housing shortage. The Housing Referral Office estimated that Fort Lewis personnel with dependents drawing BAQ would experience a shortage of approximately 314 housing units in 1989.^{1/} This estimate was based on particular definitions of supply and demand. Supply and demand were calculated as follows:

$$\begin{aligned} \text{Supply} \\ 1989 = & \left(\begin{array}{c} \text{Military Controlled} \\ \text{Housing Units } \underline{1/} \\ (1983) \end{array} \right) + \left(\begin{array}{c} \text{Non-Military Controlled} \\ \text{Housing Units } \underline{2/} \\ (1983) \end{array} \right) \\ \\ \text{Demand} \\ 1989 = & \left[\left(\begin{array}{c} \text{Forecasted Gross} \\ \text{Housing Requirements } \underline{3/} \\ (1989) \end{array} \right) - \left(\begin{array}{c} \text{Forecasted Voluntarily} \\ \text{Separated Families} \\ (1989) \end{array} \right) \right] \times .90 \end{aligned}$$

^{1/}Housing owned by the military or under contract to the military.

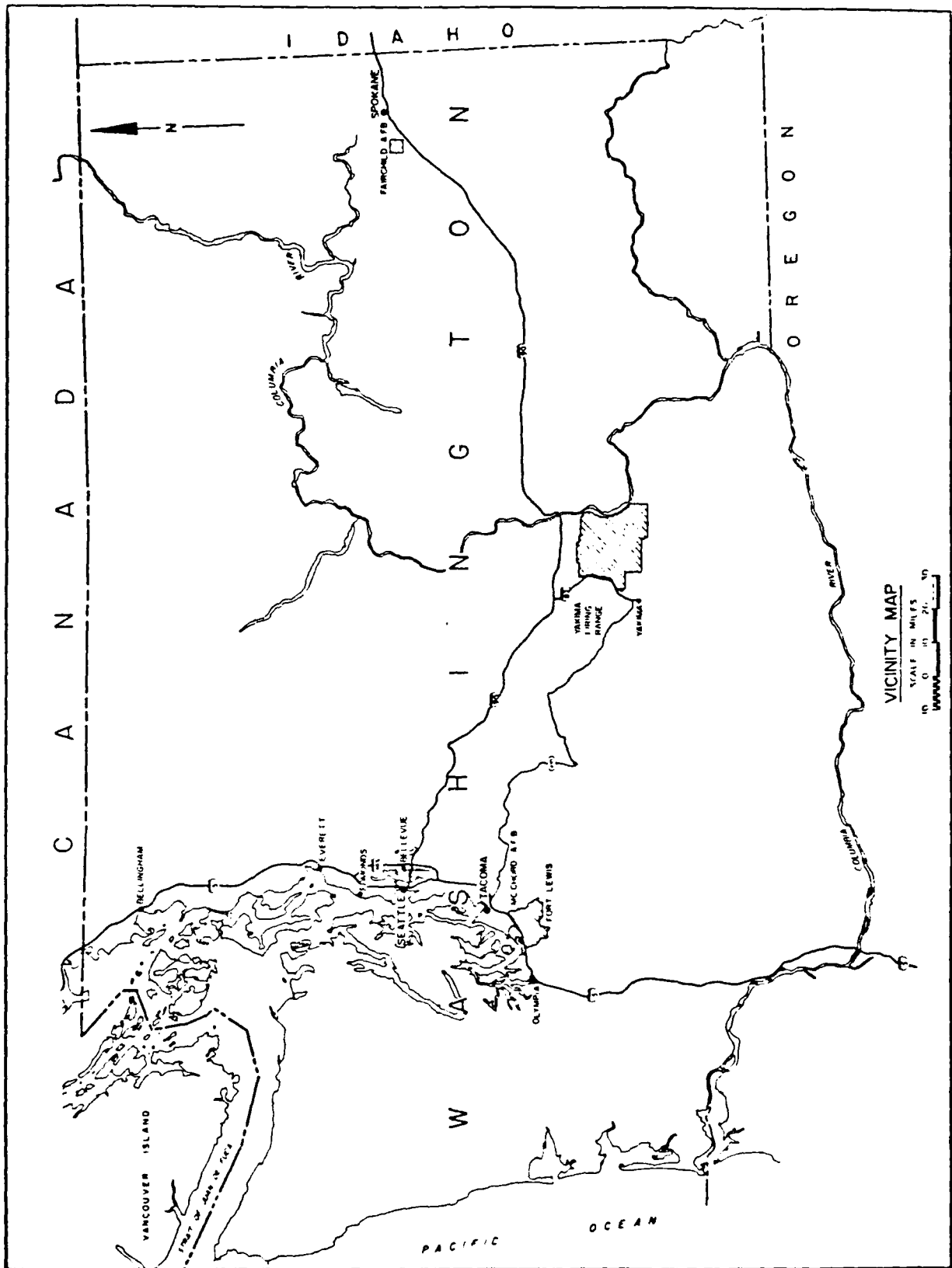
^{2/}Housing owned or rented by military personnel, available for rent to military personnel, or the military fair share of vacant rental units.

^{3/}Predicted population of officers and eligible enlisted personnel (permanent party housing strength) adjusted downward by the ratio of personnel drawing BAQ to total active duty personnel.

This study attempted to substantiate the conclusions of the military methodology, accepting the methodology as the authorized calculation procedure. Particular attention was focused on the supply of housing units. A number of units were available for either purchase or rent (table 2-1). The "military fair share" concept, however, precluded these vacancies from satisfying the military need. The military fair share idea takes the ratio of military households to total households and applies this to the number of housing vacancies to derive the fair share of vacancies for the military. Appendix D provides copies of the Tabulation of Family Housing Survey (DD Form 1377); Determination of Housing Requirements and Project Composition (DD Form 1378); and Narrative on Family Housing (DD Form 1379). These forms document the claim that a housing shortage currently exists at Fort Lewis.

^{1/}Source: DD Form 1378, line 23, column 4.

FIGURE 2-1



WASHINGTON STATE MAP

SECTION 2. DETAILED SUMMARY

2.01 Background. Fort Lewis, Washington, is headquarters for U.S. Army I Corps and Ninth Infantry Division. Fort Lewis is a major military training installation for active Army components, U.S. Army Reserve units, and National Guard elements. Fort Lewis is also home of the First Special Forces Group and the Second Battalion 75th Infantry (the Rangers). Other major tenant activities include the Madigan Army Medical Center, Army Development and Employment Agency, Fourth ROTC Region Headquarters, Washington National Guard, and numerous other tenant activities and groups in support of I CORPS and Ninth Infantry Division.

Most of the military population associated with Fort Lewis resides in Pierce and Thurston Counties, Washington. Tacoma and Olympia are the largest cities in this area, with Fort Lewis located between them as indicated in figure 2.1. The active duty population numbered 24,241 in 1983, while the dependent population was 38,958. The population of authorized active duty personnel associated with Fort Lewis is expected to grow gradually from 24,241 (1983) to 24,511 (1986) and to 26,949 (1990 and beyond). If the dependent population grows proportionately, it would increase from 38,958 (1983) to 39,218 (1986) and to 43,118 (1990 and beyond).

The total population within Pierce and Thurston Counties is expected to increase through the 1980's as shown in the following tabulation:

	<u>1984</u>	<u>1987</u>	<u>1990</u>
Pierce	514,600	526,500	550,200
Thurston	136,200	139,100	145,000

Source: Washington State, Office of Financial Management.

Approximately one of every 10 people residing in Pierce and Thurston Counties is associated with Fort Lewis. This proportion is estimated to remain nearly constant through 1990.

FIGURE 1-1

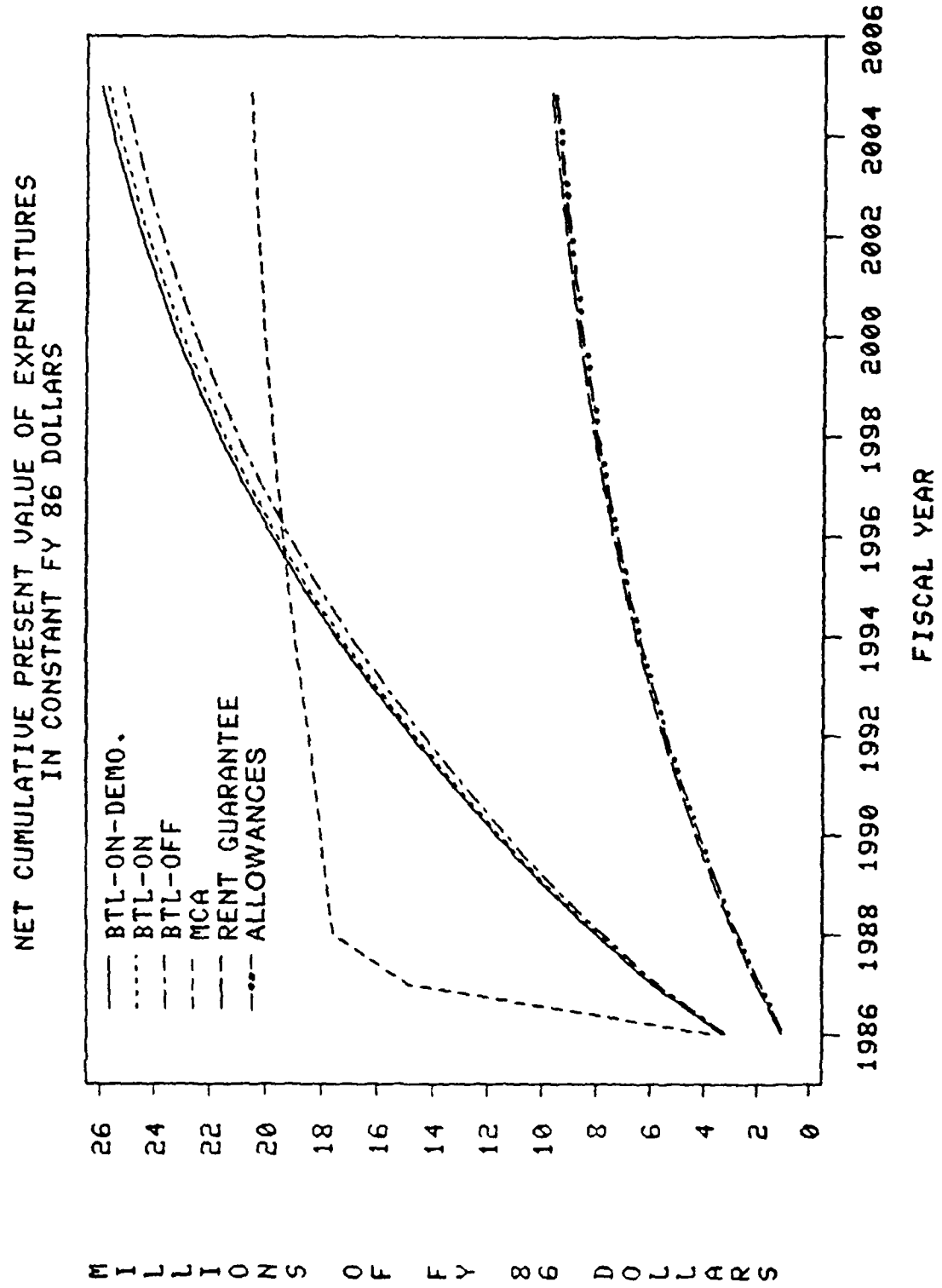
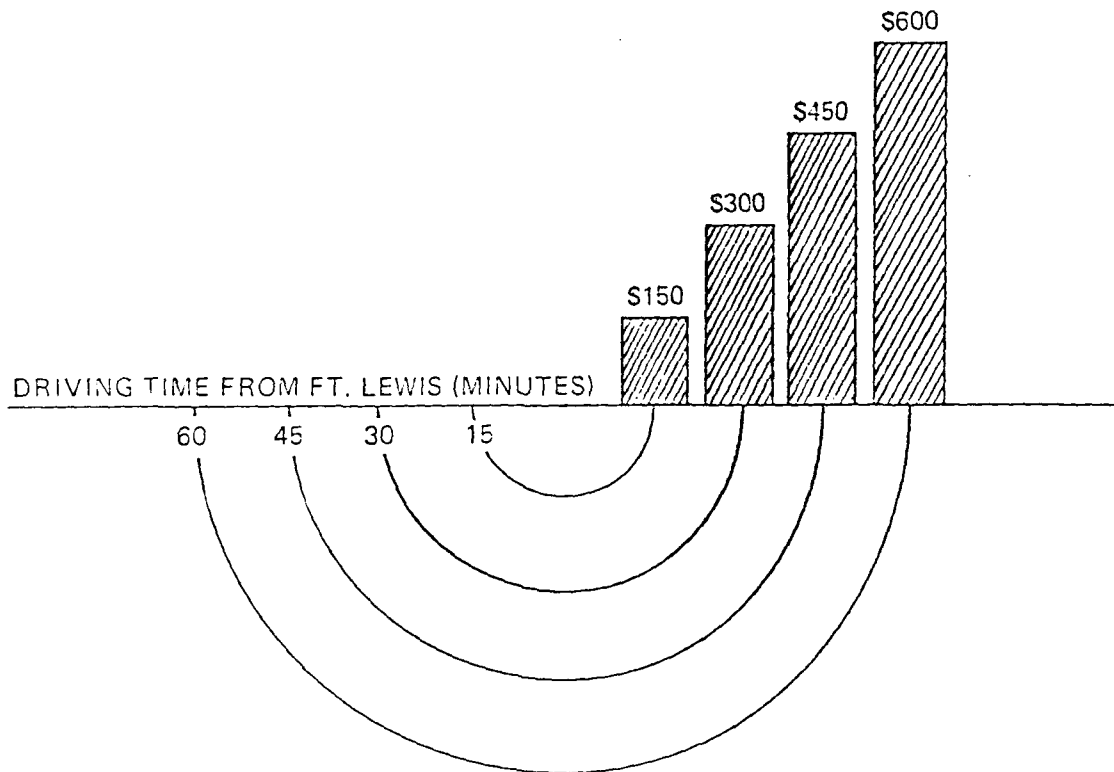


FIGURE 2-2

AVERAGE MONTHLY COMMUTING COSTS



ASSUMPTIONS:

- 1) RUSH HOUR DRIVING SPEED = 40 M.P.H.
- 2) NUMBER OF ROUND TRIPS MONTH = 35
- 3) COST OF OPERATION = 21.2¢/MILE ^{1/}

SOURCE: AAA

^{1/}BASED ON TOTAL COST OF OPERATION FOR
CHEVROLET CELEBRITY 20,000 MILES YEAR

FIGURE 2-3

COMMUTING TIME AND DISTANCE TO FORT LEWIS

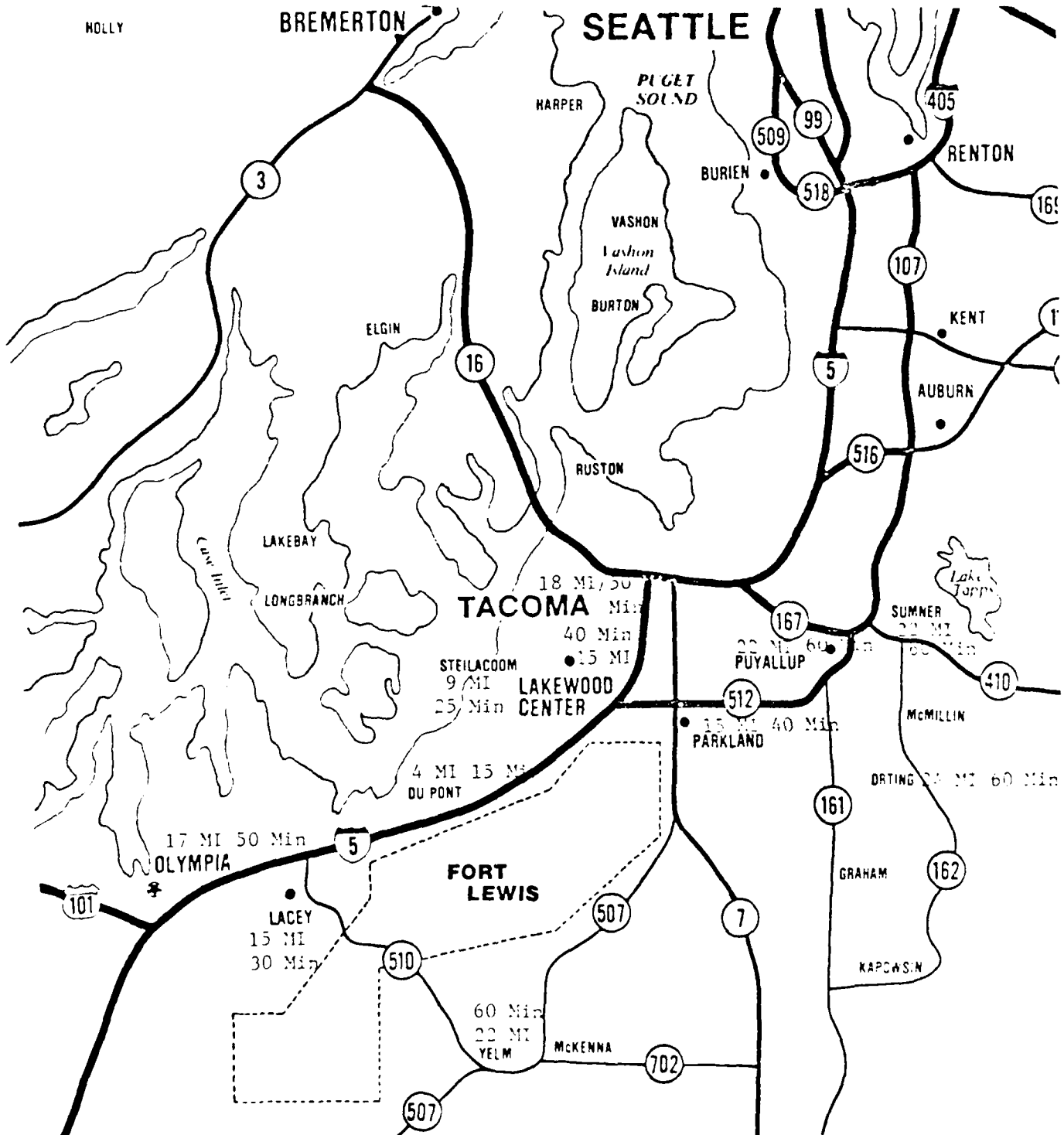


TABLE 2-7

ADDITIONAL DECISION CRITERIA

	<u>MCA</u>	<u>BTL ON-DEMO</u>	<u>BTL ON</u>	<u>BTL OFF</u>	<u>802</u>	<u>ALLOWANCES</u>
1. Driving Time/Expense	+	+	+	-	-	-
2. Personal Housing Expense ^{1/}	+	+	+	+	-	-
3. Support Service Availability	+	+	+	-	-	-
4. Community Cohesiveness	+	+	+	-	-	-

KEY: + Positive Factor
- Negative Factor

^{1/}Based on average allowance payments compared to average rental rate.

b. Personal Housing Expense. Under the MCA and three BTL alternatives, all housing costs are borne by the Government (in return for the forfeit of BAQ + VHA allowances). With the Rent Guarantee and Allowances programs, any housing costs which exceed the allowance payments must be paid by the service personnel. The BAQ + VHA payments are designed to cover 85 percent of total housing costs for average rental units in particular regions. Given this, service personnel should be expected to incur costs themselves or to live in lower than average quality housing. Average out of pocket housing expense at Fort Lewis was calculated to be \$104/month (below).

OUT OF POCKET HOUSING EXPENSE

<u>Average Housing Cost^{1/}</u>	<u>Average Housing Allowance^{2/}</u>	<u>Average Housing Expense</u>
\$460	\$356	\$104

^{1/}Weighted average of total housing costs (FY 1986). Fort Lewis FY85 Housing Survey.

^{2/}Weighted average of BAQ and VHA "with dependents" allowance payments. Fort Lewis Housing Referral Office.

c. Support Service Availability. A series of support services were readily available at Fort Lewis (ex., child care, PX, commissary, family counseling, laundry facilities, etc.). Onpost housing alternatives would locate personnel near to these facilities. The offpost alternatives would require either an extension of the outreach program or result in decreased service availability.

d. Community Cohesiveness. The offpost alternatives would result in the creation of a small military community located up to one hour drive from Fort Lewis. That separation could cause some feeling of isolation, especially for the nonmilitary spouse. The sense of community cohesiveness would be lower in the offpost than onpost alternatives.

e. Additional. Spouses of junior enlisted personnel in families with one car would face a degree of isolation in the offpost alternatives due to a lack of mobility. These spouses would also face reduced employment opportunities if housing was built in the least cost locations within the two counties.

SECTION 3. CONCLUSIONS

3.01 Results. This study has included an examination of all practical alternatives for meeting the study objective of determining the most effective means of providing adequate military family housing for 250 junior and senior non-commissioned officers at Fort Lewis. A review of the legal issues surrounding Pierce County's reversionary land provisions in the Fort Lewis deed was also conducted. The opinion of the Seattle District Real Estate Division is that the deed restriction does not preclude the onpost build to lease alternative.

The results of this analysis should be judged on the basis of two criterion: cost to the Federal Government, and in terms of personal expense/nonquantifiable quality of life impacts on the soldier and his family. Table 3-1 provides a ranking of the alternatives based upon cost to the Federal Government. The least costly alternative is continued payment of allowances with a total estimated present worth cost of \$9.5 million, followed by the rental guarantee 802 program (\$9.7 million), MCA construction (\$20.6 million), build to lease offpost 801 program (\$25.2 million), build to lease onpost 801 program (\$25.7 million), and build to lease onpost with demolition (\$26.0 million). Payment of allowances is not considered a viable solution due to the shortage of suitable rental housing in the area. On the basis of cost to the Federal Government, the rental guarantee program is viewed as the preferred economic alternative, although some developers are reportedly reluctant to accept the conditions of the Section 802 program as written.^{1/}

TABLE 3-1

SUMMARY OF GOVERNMENT COSTS FOR ECONOMIC ANALYSIS

<u>Alternative</u>	<u>Total Present Worth Cost (in \$1,000's)</u>	<u>Average Annual Equivalent Cost ^{1/} (in \$1,000's)</u>
Allowances	\$9,536	\$1,120
Rent Guarantee (802 Program)	9,660	1,135
MCA Construction	20,558	2,415
Build to Lease (801 Program) (Offpost)	25,196	2,960
Build to Lease (801 Program) (Onpost)	25,738	3,023
Build to Lease (801 Program) (Onpost, With Demolition)	25,961	3,049

^{1/}Based on a 20-year period of analysis and 10 percent discount rate.

^{1/}Telephone discussion with Major S. Ross, Army Housing Management Division, 12 December 1984.

Examinations of the direct cost to the Government should not be the sole criterion used in evaluating the alternatives. Additional costs and other nonquantifiable quality of life considerations affecting military personnel and their families, such as driving time and expense, personal housing expense, support service availability, and community cohesiveness should also be considered. Table 3-2 summarizes the affects of those "Additional Decision Criteria" upon the various alternatives. In terms of personal expense and nonquantifiable quality of life impacts to the soldier, MCA construction and the onpost build to lease alternative(s) are judged as the preferred alternatives.

TABLE 3-2

ADDITIONAL DECISION CRITERIA

	<u>MCA</u>	<u>BTL On-Demo</u>	<u>BTL On</u>	<u>BTL Off</u>	<u>802</u>	<u>Allowances</u>
1. Driving Time/Expense	+	+	+	-	-	-
2. Personal Housing Expense <u>1/</u>	+	+	+	+	-	-
3. Support Service Available	+	+	+	-	-	-
4. Community Cohesiveness	+	+	+	-	-	-

KEY: + Positive Factor
- Negative Factor

1/Based on average allowance payments compared to average rental rate.

APPENDIX A

DETAILED COST ELEMENT BUILDUP

1.01 Introduction. This section of the report covers the derivation of cost items included in this economic analysis. These component costs were used to calculate the present value costs of each alternative. All costs reflect Fiscal Year (FY) 1986 price levels maintained throughout the 20-year period of analysis, FY 1986 to FY 2005.

2.01 Cost Element Matrix. A matrix of the cost components associated with each alternative was presented in table 2-3 of the main report.

3.01 Cost Element Details.

a. Construction Cost: MCA. This alternative calls for the construction of 250 units of single-family accompanied personnel housing on Fort Lewis. Junior NCO (E-6 to E-4) personnel would occupy 227 units, while senior NCO (E-9 to E-7) would use 23 units. Provisions of DOD 4270.1-M, "Construction Criteria," December 1983, would apply. The cost estimate was based on 115 single-family turnkey units completed in 1984 at Fort Lewis. The estimate was divided into primary and support facilities costs. Primary unit costs included provision of dishwasher, refrigerator, stove, hot water tank, and smoke detector. Added to the total primary and support costs were allowances for contingencies (5 percent) and supervision/administration (5.5 percent). Total cost (FY 1984) was escalated to FY 1986 price level (table A-1).

Fort Lewis housing officials provided an MCA construction schedule. Construction was forecast to begin 1 January 1986 and to end 1 January 1988. The first 25 units had a scheduled occupancy date of August 1986, with 14 units scheduled for completion each subsequent month until the last 15 units BOD of January 1988. Construction costs were assumed to be paid incrementally at the date of beneficial occupancy (BOD). Table A-2 provides a schedule of construction costs.

TABLE A-1

CONSTRUCTION COST ESTIMATE
MCA PROGRAM

<u>Item</u>	<u>Units</u>	<u>Unit Size</u> <u>(Sq. Ft.)</u> ^{1/}	<u>Total Area</u> <u>(Sq. Ft.)</u>	<u>Unit Cost</u> <u>(\$/Sq. Ft.)</u>	<u>Cost</u>
I. Primary Facility					
A. 2 Bedroom	227	950	215,650	\$44	\$9,488,500
B. 4 Bedroom	23	1,450	33,350	39	+1,300,500
					<u>\$10,789,000</u>
II. Site Preparation & Support Facilities	250			\$17,000/ unit	<u>+\$4,250,000</u>
			Subtotal		\$15,039,000
III. Contingencies (5.0%)					<u>+\$752,000</u>
			Subtotal		<u>\$15,791,000</u>
IV. Supervision & Administration (5.5%)					<u>+\$869,000</u>
			Total (FY 1984)		<u>\$16,660,000</u>
			Price Adjustment Factor		<u>x1.0942</u>
			Total (FY 1986)		<u>\$18,230,000</u>

Source: Estimated by Seattle District Cost Engineering Section; Professional expertise supported by 1984 turnkey project cost proposal.

^{1/}Assumed maximum allowable area. AR 210-50, page I-1, "Maximum Net Floor Area Per Dwelling Unit, Imposed by 10 USC 4774."

TABLE A-2
CONSTRUCTION COST SCHEDULE
MCA PROGRAM

<u>Date</u>	<u>Total Project Cost</u>	<u>Units Completed During Year</u>	<u>Incurred Cost/Year</u> <u>1/</u>
FY 1986	\$18,230,000	.156	\$2,844,000
FY 1987		.672	12,251,000
FY 1988		.172	3,136,000
FY 1989 to FY 2005		.0	0

1/Assumed costs incurred during same fiscal year as units available for occupancy.

b. Land Acquisition: (MCA). The prime building site for the MCA and both BTL-On alternatives was the Beachwood area of Fort Lewis. According to Government convention, no cost was associated since the building site was undeveloped Federal land. One should note that use of the land as a housing site would preclude any other use, so there is an economic cost involved. But for Government accounting purposes, the land requires no additional expenditures.

c. Lease Cost: BTL, Onpost, with Demolition. This alternative called for a 20-year lease between the Government and a private contractor whereby a developer would construct, operate, and maintain 250 single-family housing units on Fort Lewis. At the end of 20 years, the developer would demolish the units and return the site to its approximate predevelopment state. (The necessity of avoiding activation of the reversionary clause would require this.) Section 802 of the Military Construction Act, 1984, would apply.

Previous housing economic analyses based their lease-rental cost upon the going market rate for comparable units. This procedure led to reported present value costs below the MCA alternative. When requests for proposals (RFP) were advertised, however, it was discovered that developers analyzed their investments differently. Due in part to the clause which states, "that the obligation of the United States to make payments under the contract in any fiscal year is subject to the availability of appropriations for that purpose," their bids have been either significantly higher than forecast or not forthcoming.

This analysis attempted to provide a more realistic estimate of lease costs to the Government. OCE recommended against quantifying a cost estimate for the build to lease alternative, citing the large number of assumptions necessary to derive a total cost. Recognizing our inability to predict lease rental costs precisely, we have nevertheless attempted to provide a ballpark figure. We can not overemphasize the tentative nature of this estimate: it was based upon numerous assumptions which are certain to gloss over the realities facing individual developers.

The lease cost estimate was based on the construction cost plus profit on construction (estimate based on 115 single-family turnkey units completed in FY 1984 at Fort Lewis). Ten percent was subtracted from this amount, representing the cost saving of the private sector compared to the Government (e.g., may use nonunion labor, less bureaucracy). The present worth of future demolition costs (remove buildings, slabs, and gas and water lines) was added to determine the total amount a developer would need to borrow. The annual interest and amortization (I&A) charge needed to repay this principle over 20 years, borrowed at 13 percent interest was used as the annual lease rental cost (table A-3).

TABLE A-3

LEASE COST ESTIMATE
BUILD TO LEASE (801) ONPOST WITH DEMOLITION

<u>Item</u>	<u>Cost</u>
Construction Cost and Profit on Construction	\$18,230,000 (FY 1986)
Cost Savings: Private vs. Government (10 Percent)	-1,823,000
Demolition Cost ^{1/}	<u>+174,000</u>
Amount Developer Must Borrow	\$16,581,000
Interest Plus Amortization Payments (20 Years, 13 Percent)	\$2,361,000/year

^{1/}\$8,000/unit x 250 units x .0868 (present worth, 13%, 20 years)

d. Lease Cost: BTL, Onpost, without Demolition. This alternative called for a 20-year lease between the Government and a private contractor, whereby a developer would construct, operate, and maintain 250 single-family units on Fort Lewis. At the end of 20 years the developer would leave the units intact and walk away from the development rather than demolish or remove the units. (This would result in a cost saving to the developer and provide additional

housing, albeit 20 years old, to the military. The cost of moving 20-year old housing relative to its market value would make this a reasonable course of action. Such a provision could be written into the lease agreement.)

The lease cost estimate was based on the construction cost plus profit on construction (estimate based on 115 single-family turnkey units completed in FY 1984 at Fort Lewis). Ten percent was subtracted from this amount, representing the cost saving of the private sector compared to the Government (e.g., may use nonunion labor, less bureaucracy). The annual interest and amortization charge necessary to repay this principle amount, over 20 years, borrowed at 13 percent interest was used as the annual lease rental cost (table A-4).

TABLE A-4

LEASE COST ESTIMATE
BUILD TO LEASE (801) ONPOST WITHOUT DEMOLITION

<u>Item</u>	<u>Cost</u>
Construction Cost and Profit on Construction	\$18,230,000 (FY 1986)
Cost Savings	<u>-1,823,000</u>
Amount Developer Must Borrow	\$16,407,000
Interest Plus Amortization Payments (20 Years, 13 Percent)	\$2,336,000/year

e. Lease Cost: BTL Offpost. This alternative called for a 20-year lease between the Government and a private contractor whereby a developer would construct, operate, and maintain 250 single-family housing units off of Fort Lewis. Section 801 of the Military Construction Act, 1984 would apply.

The lease cost estimate was based on the construction cost plus profit on construction (estimate based on 115 single-family turnkey units just completed on Fort Lewis). Ten percent was subtracted from this amount, representing the cost saving of the private sector compared to the Government (e.g., may use nonunion labor, less bureaucracy). The average cost of residential subdivision land in Pierce and Thurston Counties was added. This sum was expected to be borrowed by a developer using a 30-year loan at 13 percent interest. It was believed a developer would require a cash flow sufficient to meet the interest plus amortization payments of such a loan. The Government would pay this I&A for the first 20 years of the loan (table A-5). It is unimportant for this analysis who would occupy and pay for the units during years 21 to 30 of the loan.

TABLE A-5

LEASE COST ESTIMATE
BUILD TO LEASE (801) OFFPOST HOUSING

<u>Item</u>	<u>Cost</u>
Construction Cost and Profit on Construction	\$18,230,000 (FY 1986)
Cost Savings: Private vs. Government (10 Percent)	-1,823,000
Land Cost ^{1/} Amount Developer Must Borrow	+504,000 \$16,911,000
Interest Plus Amortization Payments (30 Years, 13 Percent)	\$2,256,000/year

^{1/}\$7,000/acre = fee value of residential subdivision land in Pierce and Thurston Counties x 72 acres (3.5 units/acre) = \$504,000.

f. BAQ/VHA (802, Allowances). Allowances were based on the BAQ and the VHA "with dependents" for Fort Lewis, September 1984 (reflecting FY 1986 prices). The distribution of enlisted personnel (E-4 to E-9) was provided by Fort Lewis Housing Office. The distribution schedule allowed calculation of weighted average monthly allowances for both senior and junior NCO's. Final adjustment for the number of units provided a total monthly allowance cost (table A-6). Annual expenditures were the sum of 12 equal monthly payments of \$89,000 over the life of the project, or \$1,068,000/year (table A-7).

TABLE A-6

BAQ + VHA ALLOWANCES COST ESTIMATE
RENT GUARANTEE (802) & ALLOWANCES PROGRAM

<u>Grade</u>	<u>Monthly BAQ+VHA</u>	<u>Distribution 1/</u>	<u>Average Cost/Unit Month</u>
E-9	\$483.08	.059	\$28.50
E-8	480.82	.231	108.76
E-7	434.70	.710	<u>308.64</u>
Total			\$445.90 (FY 1984)
Price Adjustment Factor			x 1.0941
			<u>\$487.90 (FY 1986)</u>
			<u>x 23 Units</u>
Senior NCO Monthly Cost			\$11,000.00
E-6	\$373.06	.212	\$79.09
E-5	331.65	.312	103.47
E-4	276.62	.476	<u>131.67</u>
Total			\$314.23 (FY 1984)
Price Adjustment Factor			x 1.0942
			<u>\$343.83 (FY 1986)</u>
			<u>x 227 Units</u>
Junior NCO Monthly Cost			\$78,000.00

Total Weighted Monthly Cost = \$89,000

1/Total senior NCO onpost (E-9 to E-7) = 1,965
Total junior NCO onpost (E-6 to E-4) = 12,008

ANALYSIS OF COSTS FOR ECONOMIC ANALYSIS
REPORT BY YLAP

FAMILY HOUSING ECONOMIC ANALYSIS
FORT LEWIS, WASHINGTON
SEATTLE DISTRICT
ARMY CORPS OF ENGINEERS
(206) 764-3646

NEW CONSTRUCTION

ISSUING ORGANIZATION

LEWIS, WASHINGTON

DATE OF SUBMISSION

1954

PROJECT TITLE

ANALYSIS OF FAMILY HOUSING

STATEMENT OF PROGRAM OBJECTIVE

TO DETERMINE THE FEASIBILITY OF PROVIDING NEW HOUSING FOR

LEWIS, WASHINGTON

LEWIS, WASHINGTON

LEWIS, WASHINGTON

NAME OF ANALYST

1

LEASE COST (BTL-OFF) (05)	BAGWHA ALLOWANCES (MCA, BTL) (07)	MAINTENANCE & REPAIR (MCA, BTL) (08)	UTILITIES COST (BTL-OFF) (10)	SERVICES COST (MCA, BTL) (11)
\$2,256,000	\$1,045,000	\$0	\$5,000	\$700
\$2,256,000	\$813,000	\$1,500	\$137,000	\$17,000
\$2,256,000	\$18,000	\$36,000	\$240,000	\$23,500
\$2,256,000	\$0	\$69,000	\$244,000	\$33,000
\$2,256,000	\$0	\$70,000	\$244,000	\$33,000
\$2,256,000	\$0	\$75,000	\$244,000	\$33,000
\$2,256,000	\$0	\$185,000	\$244,000	\$33,000
\$2,256,000	\$0	\$268,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000
\$2,256,000	\$0	\$291,000	\$244,000	\$33,000

CONTRACT ADMIN (BTL, OFF) (12)	TOTAL ANNUAL OUTLAYS	DISCOUNTED PRESENT VALUE	CUMULATING NET DISC P.V.
\$12,111	\$12,111.00	\$11,163.972	\$11,163.972
\$11,171	\$11,171.00	\$10,211.170	\$21,375.142
\$11,111	\$11,111.00	\$10,111.111	\$31,486.253
\$10,911	\$10,911.00	\$9,911.110	\$41,397.363
\$11,111	\$11,111.00	\$10,111.111	\$51,508.474
\$11,111	\$11,111.00	\$10,111.111	\$61,619.585
\$11,111	\$11,111.00	\$10,111.111	\$71,730.696
\$11,111	\$11,111.00	\$10,111.111	\$81,841.807
\$11,111	\$11,111.00	\$10,111.111	\$91,952.918
\$11,111	\$11,111.00	\$10,111.111	\$102,064.029
\$11,111	\$11,111.00	\$10,111.111	\$112,175.140
\$11,111	\$11,111.00	\$10,111.111	\$122,286.251
\$11,111	\$11,111.00	\$10,111.111	\$132,397.362
\$11,111	\$11,111.00	\$10,111.111	\$142,508.473
\$11,111	\$11,111.00	\$10,111.111	\$152,619.584
\$11,111	\$11,111.00	\$10,111.111	\$162,730.695
\$11,111	\$11,111.00	\$10,111.111	\$172,841.806
\$11,111	\$11,111.00	\$10,111.111	\$182,952.917
\$11,111	\$11,111.00	\$10,111.111	\$193,064.028
\$11,111	\$11,111.00	\$10,111.111	\$203,175.139
\$11,111	\$11,111.00	\$10,111.111	\$213,286.250
\$11,111	\$11,111.00	\$10,111.111	\$223,397.361
\$11,111	\$11,111.00	\$10,111.111	\$233,508.472
\$11,111	\$11,111.00	\$10,111.111	\$243,619.583
\$11,111	\$11,111.00	\$10,111.111	\$253,730.694
\$11,111	\$11,111.00	\$10,111.111	\$263,841.805
\$11,111	\$11,111.00	\$10,111.111	\$273,952.916
\$11,111	\$11,111.00	\$10,111.111	\$284,064.027
\$11,111	\$11,111.00	\$10,111.111	\$294,175.138
\$11,111	\$11,111.00	\$10,111.111	\$304,286.249
\$11,111	\$11,111.00	\$10,111.111	\$314,397.360
\$11,111	\$11,111.00	\$10,111.111	\$324,508.471
\$11,111	\$11,111.00	\$10,111.111	\$334,619.582
\$11,111	\$11,111.00	\$10,111.111	\$344,730.693
\$11,111	\$11,111.00	\$10,111.111	\$354,841.804
\$11,111	\$11,111.00	\$10,111.111	\$364,952.915
\$11,111	\$11,111.00	\$10,111.111	\$375,064.026
\$11,111	\$11,111.00	\$10,111.111	\$385,175.137
\$11,111	\$11,111.00	\$10,111.111	\$395,286.248
\$11,111	\$11,111.00	\$10,111.111	\$405,397.359
\$11,111	\$11,111.00	\$10,111.111	\$415,508.470
\$11,111	\$11,111.00	\$10,111.111	\$425,619.581
\$11,111	\$11,111.00	\$10,111.111	\$435,730.692
\$11,111	\$11,111.00	\$10,111.111	\$445,841.803
\$11,111	\$11,111.00	\$10,111.111	\$455,952.914
\$11,111	\$11,111.00	\$10,111.111	\$466,064.025
\$11,111	\$11,111.00	\$10,111.111	\$476,175.136
\$11,111	\$11,111.00	\$10,111.111	\$486,286.247
\$11,111	\$11,111.00	\$10,111.111	\$496,397.358
\$11,111	\$11,111.00	\$10,111.111	\$506,508.469
\$11,111	\$11,111.00	\$10,111.111	\$516,619.580
\$11,111	\$11,111.00	\$10,111.111	\$526,730.691
\$11,111	\$11,111.00	\$10,111.111	\$536,841.802
\$11,111	\$11,111.00	\$10,111.111	\$546,952.913
\$11,111	\$11,111.00	\$10,111.111	\$557,064.024
\$11,111	\$11,111.00	\$10,111.111	\$567,175.135
\$11,111	\$11,111.00	\$10,111.111	\$577,286.246
\$11,111	\$11,111.00	\$10,111.111	\$587,397.357
\$11,111	\$11,111.00	\$10,111.111	\$597,508.468
\$11,111	\$11,111.00	\$10,111.111	\$607,619.579
\$11,111	\$11,111.00	\$10,111.111	\$617,730.690
\$11,111	\$11,111.00	\$10,111.111	\$627,841.801
\$11,111	\$11,111.00	\$10,111.111	\$637,952.912
\$11,111	\$11,111.00	\$10,111.111	\$648,064.023
\$11,111	\$11,111.00	\$10,111.111	\$658,175.134
\$11,111	\$11,111.00	\$10,111.111	\$668,286.245
\$11,111	\$11,111.00	\$10,111.111	\$678,397.356
\$11,111	\$11,111.00	\$10,111.111	\$688,508.467
\$11,111	\$11,111.00	\$10,111.111	\$698,619.578
\$11,111	\$11,111.00	\$10,111.111	\$708,730.689
\$11,111	\$11,111.00	\$10,111.111	\$718,841.800
\$11,111	\$11,111.00	\$10,111.111	\$728,952.911
\$11,111	\$11,111.00	\$10,111.111	\$739,064.022
\$11,111	\$11,111.00	\$10,111.111	\$749,175.133
\$11,111	\$11,111.00	\$10,111.111	\$759,286.244
\$11,111	\$11,111.00	\$10,111.111	\$769,397.355
\$11,111	\$11,111.00	\$10,111.111	\$779,508.466
\$11,111	\$11,111.00	\$10,111.111	\$789,619.577
\$11,111	\$11,111.00	\$10,111.111	\$799,730.688
\$11,111	\$11,111.00	\$10,111.111	\$809,841.799
\$11,111	\$11,111.00	\$10,111.111	\$819,952.910
\$11,111	\$11,111.00	\$10,111.111	\$830,064.021
\$11,111	\$11,111.00	\$10,111.111	\$840,175.132
\$11,111	\$11,111.00	\$10,111.111	\$850,286.243
\$11,111	\$11,111.00	\$10,111.111	\$860,397.354
\$11,111	\$11,111.00	\$10,111.111	\$870,508.465
\$11,111	\$11,111.00	\$10,111.111	\$880,619.576
\$11,111	\$11,111.00	\$10,111.111	\$890,730.687
\$11,111	\$11,111.00	\$10,111.111	\$900,841.798
\$11,111	\$11,111.00	\$10,111.111	\$910,952.909
\$11,111	\$11,111.00	\$10,111.111	\$921,064.020
\$11,111	\$11,111.00	\$10,111.111	\$931,175.131
\$11,111	\$11,111.00	\$10,111.111	\$941,286.242
\$11,111	\$11,111.00	\$10,111.111	\$951,397.353
\$11,111	\$11,111.00	\$10,111.111	\$961,508.464
\$11,111	\$11,111.00	\$10,111.111	\$971,619.575
\$11,111	\$11,111.00	\$10,111.111	\$981,730.686
\$11,111	\$11,111.00	\$10,111.111	\$991,841.797
\$11,111	\$11,111.00	\$10,111.111	\$1,001,952.908
\$11,111	\$11,111.00	\$10,111.111	\$1,012,064.019
\$11,111	\$11,111.00	\$10,111.111	\$1,022,175.130
\$11,111	\$11,111.00	\$10,111.111	\$1,032,286.241
\$11,111	\$11,111.00	\$10,111.111	\$1,042,397.352
\$11,111	\$11,111.00	\$10,111.111	\$1,052,508.463
\$11,111	\$11,111.00	\$10,111.111	\$1,062,619.574
\$11,111	\$11,111.00	\$10,111.111	\$1,072,730.685
\$11,111	\$11,111.00	\$10,111.111	\$1,082,841.796
\$11,111	\$11,111.00	\$10,111.111	\$1,092,952.907
\$11,111	\$11,111.00	\$10,111.111	\$1,103,064.018
\$11,111	\$11,111.00	\$10,111.111	\$1,113,175.129
\$11,111	\$11,111.00	\$10,111.111	\$1,123,286.240
\$11,111	\$11,111.00	\$10,111.111	\$1,133,397.351
\$11,111	\$11,111.00	\$10,111.111	\$1,143,508.462
\$11,111	\$11,111.00	\$10,111.111	\$1,153,619.573
\$11,111	\$11,111.00	\$10,111.111	\$1,163,730.684
\$11,111	\$11,111.00	\$10,111.111	\$1,173,841.795
\$11,111	\$11,111.00	\$10,111.111	\$1,183,952.906
\$11,111	\$11,111.00	\$10,111.111	\$1,194,064.017
\$11,111	\$11,111.00	\$10,111.111	\$1,204,175.128
\$11,111	\$11,111.00	\$10,111.111	\$1,214,286.239
\$11,111	\$11,111.00	\$10,111.111	\$1,224,397.350
\$11,111	\$11,111.00	\$10,111.111	\$1,234,508.461
\$11,111	\$11,111.00	\$10,111.111	\$1,244,619.572
\$11,111	\$11,111.00	\$10,111.111	\$1,254,730.683
\$11,111	\$11,111.00	\$10,111.111	\$1,264,841.794
\$11,111	\$11,111.00	\$10,111.111	\$1,274,952.905
\$11,111	\$11,111.00	\$10,111.111	\$1,285,064.016
\$11,111	\$11,111.00	\$10,111.111	\$1,295,175.127
\$11,111	\$11,111.00	\$10,111.111	\$1,305,286.238
\$11,111	\$11,111.00	\$10,111.111	\$1,315,397.349
\$11,111	\$11,111.00	\$10,111.111	\$1,325,508.460
\$11,111	\$11,111.00	\$10,111.111	\$1,335,619.571
\$11,111	\$11,111.00	\$10,111.111	\$1,345,730.682
\$11,111	\$11,111.00	\$10,111.111	\$1,355,841.793
\$11,111	\$11,111.00	\$10,111.111	\$1,365,952.904
\$11,111	\$11,111.00	\$10,111.111	\$1,376,064.015
\$11,111	\$11,111.00	\$10,111.111	\$1,386,175.126
\$11,111	\$11,111.00	\$10,111.111	\$1,396,286.237
\$11,111	\$11,111.00	\$10,111.111	\$1,406,397.348
\$11,111	\$11,111.00	\$10,111.111	\$1,416,508.459
\$11,111	\$11,111.00	\$10,111.111	\$1,426,619.570
\$11,111	\$11,111.00	\$10,111.111	\$1,436,730.681
\$11,111	\$11,111.00	\$10,111.111	\$1,446,841.792
\$11,111	\$11,111.00	\$10,111.111	\$1,456,952.903
\$11,111	\$11,111.00	\$10,111.111	\$1,467,064.014
\$11,111	\$11,111.00	\$10,111.111	\$1,477,175.125
\$11,111	\$11,111.00	\$10,111.111	\$1,487,286.236
\$11,111	\$11,111.00	\$10,111.111	\$1,497,397.347
\$11,111	\$11,111.00	\$10,111.111	\$1,507,508.458
\$11,111	\$11,111.00	\$10,111.111	\$1,517,619.569
\$11,111	\$11,111.00	\$10,111.111	\$1,527,730.680
\$11,111	\$11,111.00	\$10,111.111	\$1,537,841.791
\$11,111	\$11,111.00	\$10,111.111	\$1,547,952.902
\$11,111	\$11,111.00	\$10,111.111	\$1,558,064.013
\$11,111	\$11,111.00	\$10,111.111	\$1,568,175.124
\$11,111	\$11,111.00	\$10,111.111	\$1,578,286.235
\$11,111	\$11,111.00	\$10,111.111	\$1,588,397.346
\$11,111	\$11,111.00	\$10,111.111	\$1,598,508.457
\$11,111	\$11,111.00	\$10,111.111	\$1,608,619.568
\$11,111	\$11,111.00	\$10,111.111	\$1,618,730.679
\$11,111	\$11,111.00	\$10,111.111	\$1,628,841.790
\$11,111	\$11,111.00	\$10,111.111	\$1,638,952.901
\$11,111	\$11,111.00	\$10,111.111	\$1,649,064.012
\$11,111	\$11,111.00	\$10,111.111	\$1,659,175.123
\$11,111	\$11,111.00	\$10,111.111	\$1,669,286.234
\$11,111	\$11,111.00	\$10,111.111	\$1,679,397.345
\$11,111	\$11,111.00	\$10,111.111	\$1,689,508.456
\$11,111	\$11,111.00	\$10,111.111	\$1,699,619.567
\$11,111	\$11,111.00	\$10,111.111	\$1,709,730.678
\$11,111	\$11,111.00	\$10,111.111	\$1,719,841.789
\$11,111	\$11,111.00	\$10,111.111	\$1,729,952.900
\$11,111	\$11,111.00	\$10,111.111	\$1,740,064.011
\$11,111	\$11,111.00	\$10,111.111	\$1,750,175.122
\$11,111	\$11,111.00	\$10,111.111	\$1,760,286.233
\$11,111	\$11,111.00	\$10,111.111	\$1,770,397.344
\$11,111	\$11,111.00	\$10,111.111	\$1,780,508.455
\$11,111	\$11,111.00	\$10,111.111	\$1,790,619.566
\$11,111	\$11,111.00	\$10,111.111	\$1,800,730.677
\$11,111	\$11,111.00	\$10,111.111	\$1,810,841.788
\$11,111	\$11,111.00	\$10,111.111	\$1,820,952.899
\$11,111	\$11,111.00	\$10,111.111	\$1,831,064.010
\$11,111	\$11,111.00	\$10,111.111	\$1,841,175.121
\$11,111	\$11,111.00	\$10,111.111	\$1,851,286.232
\$11,111	\$11,111.00	\$10,111.111	\$1,861,397.343
\$11,111	\$11,111.00	\$10,111.111	\$1,871,508.454
\$11,111	\$11,111.00	\$10,111.111	\$1,881,619.565
\$11,111	\$11,111.00	\$10,111.111	\$1,891,730.676
\$11,111	\$11,111.00	\$10,111.111	\$1,901,841.787
\$11,111	\$11,111.00	\$10,111.111	\$1,911,952.898
\$11,111	\$11,111.00	\$10,111.111	\$1,922,064.009
\$11,111	\$11,111.00	\$10,111.111	\$1,932,175.120
\$11,111	\$11,111.00	\$10,111.111	\$1,942,286.231
\$11,111	\$11,111.00	\$10,111.111	\$1,952,397.342
\$11,111	\$11,111.00	\$10,111.111	\$1,962,508.453
\$11,111	\$11,111.00	\$10,111.111	\$1,972,619.564
\$11,111	\$11,111.00	\$10,111.111	\$1,982,730.675
\$11,111	\$11,111.00	\$10,111.111	\$1,992,841.786
\$11,111	\$11,111.00	\$10,111.111	\$2,002,952.897
\$11,111	\$11,111.00	\$10,111.111	\$2,013,064.008
\$11,111	\$11,111.00	\$10,111.111	\$2,023,175.119
\$11,111	\$11,111.00	\$10,111.111	\$2,033,286.230
\$11,111	\$11,111.00	\$10,111.111	\$2,043,39

STATE OF COSTS FOR ECONOMIC ANALYSIS
REPORT BY YEAR

FAMILY HOUSING ECONOMIC ANALYSIS
FORT LEWIS, WASHINGTON
SEATTLE DISTRICT
ARMY CORPS OF ENGINEERS
(206) 764-3646

BUILD TO LEASE PROGRAM
OFF BASE

SPONSORING ORGANIZATION

LEWIS, WASHINGTON

DATE OF SUBMISSION

HALF 1994

SUBJECT TITLE

UNIT ANALYSIS OF FAMILY HOUSING

DESCRIPTION OF PROGRAM OBJECTIVE

TO IDENTIFY ALTERNATIVE TO GOVERNMENT TO PROVIDE 150 HOUSING UNITS

LEWIS, WASHINGTON

ANALYST NAME

SPILL OF ANALYSIS

1994

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1. The first group of variables includes the variables that are used in the first stage of the analysis. These variables are the variables that are used to explain the dependent variable in the first stage of the analysis.

MINIMUM COSTS FOR ECONOMIC ANALYSIS
REPORT BY YEAR

FAMILY HOUSING ECONOMIC ANALYSIS
FORT LEWIS, WASHINGTON
SEATTLE DISTRICT
ARMY CORPS OF ENGINEERS
(206) 764-3646

BUILD TO LEASE PROGRAM
ON BASE
WITHOUT DEMOLITION

SUBMITTING ORGANIZATION

FORT LEWIS, WASHINGTON

DATE OF SUBMISSION

JANUARY 1980

PROJECT TITLE

ECONOMIC ANALYSIS OF FAMILY HOUSING

DESCRIPTION OF PROGRAM OBJECTIVE

Determine least-cost alternative to government to provide 250 housing units

ALTERNATIVE

1-00

ECONOMIC LIFE

PERIOD OF ANALYSIS

YEARS

1980-1990

1980-1990

AR	LEASE COST (BTL-ON-D) (03)	SAG/URA ALLOWANCES (MCA, BTL) (07)	MAINTENANCE & REPAIR (MCA, BTL) (08)	UTILITIES COST (MCA, BTL-ON) (09)	SERVICES COST (MCA, BTL) (11)
86	\$2,361,000	\$1,045,000	\$0	\$5,000	\$700
87	\$2,361,000	\$513,000	\$1,500	\$115,000	\$17,000
88	\$2,361,000	\$16,000	\$36,000	\$218,000	\$32,500
89	\$2,361,000	\$0	\$69,000	\$221,000	\$33,000
90	\$2,361,000	\$0	\$70,000	\$221,000	\$33,000
91	\$2,361,000	\$0	\$75,000	\$221,000	\$33,000
92	\$2,361,000	\$0	\$185,000	\$221,000	\$33,000
93	\$2,361,000	\$0	\$288,000	\$221,000	\$33,000
94	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
95	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
96	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
97	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
98	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
99	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
00	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
01	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
02	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
03	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
04	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000
05	\$2,361,000	\$0	\$291,000	\$221,000	\$33,000

AR	CONTRACT ADMIN (BTL, 802) (12)	TOTAL ANNUAL OUTLAYS	DISCOUNTED PRESENT VALUE	CUMULATIVE NET DISC P.V.
86	\$13,800	\$2,425,500	\$2,266,056	\$3,266,086
87	\$13,800	\$2,021,300	\$1,818,815	\$5,084,901
88	\$13,800	\$2,677,600	\$2,109,373	\$7,194,274
89	\$13,800	\$2,697,800	\$1,932,570	\$9,126,845
90	\$13,800	\$2,685,300	\$1,757,333	\$10,884,179
91	\$13,800	\$2,737,900	\$1,590,717	\$12,474,896
92	\$13,800	\$2,813,300	\$1,514,401	\$14,009,297
93	\$13,800	\$2,913,000	\$1,427,123	\$15,436,420
94	\$13,800	\$2,919,300	\$1,298,719	\$16,735,139
95	\$13,800	\$2,919,300	\$1,184,633	\$17,919,772
96	\$13,800	\$2,913,300	\$1,073,321	\$18,993,093
97	\$13,800	\$2,913,300	\$975,747	\$19,968,840
98	\$13,800	\$2,913,300	\$887,042	\$20,855,882
99	\$13,800	\$2,913,300	\$803,412	\$21,659,294
00	\$13,800	\$2,913,300	\$721,096	\$22,380,390
01	\$13,800	\$2,913,300	\$641,438	\$23,021,828
02	\$13,800	\$2,913,300	\$563,841	\$23,585,669
03	\$13,800	\$2,913,300	\$488,711	\$24,074,380
04	\$13,800	\$2,913,300	\$415,461	\$24,489,841
05	\$13,800	\$2,913,300	\$343,601	\$24,833,442

DISCOUNT APPLIED TO OUTLAYS AT = 4.00% PER ANNUM (1965-1975) 10% PER ANNUM (1976-1985)

TABLE A-15

S U M M A R Y O F C O S T S F O R E C O N O M I C A N A L Y S I S
R E P O R T B Y Y E A R

FAMILY HOUSING ECONOMIC ANALYSIS
FORT LEWIS, WASHINGTON
SEATTLE DISTRICT
ARMY CORPS OF ENGINEERS
(206) 764-3646

BUILD TO LEASE PROGRAM
ON BASE
WITH DEMOLITION

1. SUBMITTING ORGANIZATION

FORT LEWIS, WASHINGTON

2. DATE OF SUBMISSION

NOVEMBER 1984

3. PROJECT TITLE

ECONOMIC ANALYSIS OF FAMILY HOUSING

4. DESCRIPTION OF PROGRAM OBJECTIVE

DETERMINE LEAST-COST ALTERNATIVE TO GOVERNMENT TO PROVIDE 250 HOUSING UNITS

5. ALTERNATIVES

BTL-ON-DEMO.

6. ECONOMIC LIFE

7. PERIOD OF ANALYSIS

75 YEARS

A-15.

A-15.

4.01 Calculations of Each Alternative.

a. Table A-15 contains a year by year table of results for the six alternatives. For each alternative, the display table shows, in constant dollars, the following items for each year of the 20-year period of analysis:

- (1) The estimated amount for each expense element.
- (2) The total of all expense elements ("TOTAL ANNUAL OUTLAYS").
- (3) The present value of all expense elements ("DISCOUNTED PRESENT VALUE").
- (4) The present value of all expense elements through indicated year ("CUMULATIVE DISCOUNT PRESENT VALUE").
- (5) The present value of net residual, or salvage value, for each year if project were terminated in that year ("DISCOUNTED P.V., RESIDUAL").
- (6) The cumulative present value of costs through given year less present value of residual for given year ("CUMULATIVE NET DISCOUNTED P.V.").
- (7) The annualized cost (uniform annual equivalent cost for the 20-year period of analysis).

TABLE A-13

SERVICES COST ESTIMATE
MCA & BTL PROGRAMS

Type of Unit	Units	Unit Size (Sq. Ft.)	Total Area (Sq. Ft.)	Unit Cost (\$/Sq. Ft.) ^{1/}	Cost
2 Bedroom	227	950	215,650	.1156	\$24,929
4 Bedroom	23	1,450	33,350		+3,855
		Total (FY 1983)			\$28,784
		Price Adjustment Factor			x1.1541
					\$33,220

Total (FY 1986) = \$33,000/year
= \$130/unit/year

^{1/}\$656,400 (FY 1983) total services cost ÷ 5,675,897 square feet.

TABLE A-14

SERVICES COST SCHEDULE
MCA & BTL PROGRAMS

<u>Date</u>	<u>Cost</u>
FY 86	\$700
87	17,000
88	32,500
89-05	33,000

1. Contract Administration (BTL, 802). The BTL program involves Government supervision of a contract with developer (who builds and maintain the 250 new housing units). The rental guarantee program contract requires the Government to maintain full occupancy of the new units. Fort Lewis housing officials agreed that administration of these contracts would introduce costs to them not found under the MCA or economy housing alternatives. The cost of contract administration alone was estimated to be \$13,800 (approximately one GS-5, step one, salary). It was assumed that contract administration would begin at the start of FY 1986. Costs were assumed to remain constant throughout the study.

TABLE A-11

UTILITIES COST SCHEDULE
MCA AND BTL-ON PROGRAM

<u>Date</u>	<u>Cost</u>
FY86	\$ 5,000
87	115,000
88	218,000
89-05	221,000

j. Utilities (BTL-OFF). Utility expenses were based on estimated costs for existing onpost housing, augmented with higher electric rates offpost compared to onpost. Utilities costs for onpost housing were estimated to be \$221,000/year. Utilities costs offpost were estimated to be 10 percent higher than onpost ($\$221,000 \times 1.10 = \$243,000$). Offpost consumers of electricity pay approximately twice as much as do Fort Lewis users. Given the true weight of electricity costs in the total utilities costs, a 10 percent upward adjustment was made. Dividing the annual utilities costs for all units by 12 equalled the average monthly utilities costs for all units ($\$243,000 \div 12 = \$20,300$). Monthly costs were adjusted downward to reflect the percentage of total units actually occupied. Summation of monthly costs provided the annual utilities costs shown in table A-12.

TABLE A-12

UTILITIES COST SCHEDULE
BTL-OFF PROGRAM

<u>Date</u>	<u>Cost</u>
FY86	\$ 5,000
87	127,000
88	240,000
89-05	244,000

k. Services (MCA, BTL). Cost elements in the services account include refuse collection/disposal, fire and police protection, entomology and custodial services, snow removal, street cleaning, and refuse containers. Service expenses were obtained for existing housing from Fort Lewis housing officials. Service costs for the new units, calculated on a square foot basis, were assumed to equal rates for existing housing (table A-13). Service costs were assumed to begin at the date of beneficial occupancy. Based upon the schedule of construction, service costs will begin July 1986, increase until December 1987, and remain constant beyond that date. Table A-14 provides a schedule of service expenditures.

TABLE A-10

MAINTENANCE AND REPAIR SCHEDULE
MCA & BTL PROGRAMS

<u>Date</u>	<u>Cost</u>
FY 86	\$0
87	1,500
88	36,000
89	69,000
90	70,000
91	75,000
92	185,000
93	288,000
94-05	291,000

i. Utilities (MCA, BTL-ON). Utility expenses were based largely on current consumption levels for existing onpost housing. Costs data was provided by Fort Lewis Family Housing Office. Expense items included electricity, fuel oil, water, utilities, and Director of Engineering and Housing Reimbursement (DEH Reimb.). New housing would use natural gas for heating rather than fuel oil. DEH Reimbursable costs were repayments for items contracted from the Engineering section. Annual utility expenses were estimated as:

<u>Cost Element</u>	<u>Annual Cost (FY86)</u>
Electricity	\$ 1,700
Natural Gas	148,300
Water	800
Sewage	500
DEH Reimb.	+70,000
	<u>\$221,300/year</u>

Dividing the annual utilities costs for all units by 12 equalled the monthly utilities costs for all units ($\$221,300 \div 12 = \$18,400$). Monthly costs were adjusted downward to reflect the percentage of total units actually occupied.

Summation of monthly costs provided the annual utilities costs shown in table A-11:

TABLE A-9

MAINTENANCE AND REPAIR COST ESTIMATE
MCA & BTL PROGRAMS

<u>Item</u> ^{1/}	<u>Total Fort Lewis Cost</u> ^{2/}	<u>Project Size Weight</u> ^{3/}	<u>Project Cost Weight</u> ^{4/}	<u>Expected Cost</u>
Total M&R	\$5,736,700	.0439		
I Maintenance			.240	\$60,500 (FY 83)
		Price Adjustment Factor		<u>x1.1541</u>
		Annual		\$70,000 (FY 86)
		Monthly		\$5,800
II Repairs			.760	\$191,500 (FY 83)
		Price Adjustment Factor		<u>x1.1541</u>
		Annual		\$221,000 (FY 86)
		Monthly		\$18,4090
Total = \$291,000/year (\$70,000 + \$221,000) = \$1,164/unit/year				
= \$24,200/month (\$5,800 + \$18,400) = \$97/unit/month				

^{1/}Maintenance: preventive maintenance plus minor repairs performed between periods of occupancy.

Repair: major repairs (i.e., roofing, repair kitchen cabinets, gutters, etc.).

^{2/}Source: FY 1983 - Final BP 1920 - Maintenance and Repair

^{3/}Total Fort Lewis housing area = 5,675,897 square feet

250 new units housing area = 249,000 square feet

^{4/}Total FY 1983 Fort Lewis M&R cost = \$5,736,700

Maintenance cost = \$1,377,500

Repair cost = \$4,359,200

TABLE A-8

BAQ + VHA ALLOWANCES COST ESTIMATE AND SCHEDULE
MCA & BTL PROGRAMS

<u>Date</u>	<u>Completed Units</u>	<u>Remaining BAQ + VHA Units</u>	<u>BAQ + VHA Cost/Unit</u>	<u>Remaining BAQ + VHA Costs (FY 86)</u>
July 1986	0	250	\$356	\$89,000
August	25	225		80,100
September	39	221		75,116
October	53	197		70,132
November	67	183		65,148
December	81	169		60,164
January 1987	95	155		55,180
February	109	141		50,196
March	123	127		45,212
April	137	113		40,228
May	151	99		35,244
June	165	85		30,260
July	179	71		25,276
August	193	57		20,292
September	207	43		15,308
October	221	29		10,324
November	235	15		5,340
December	250	0		0

FY 86: (10 X \$89,000) + \$80,100 + \$75,116 = \$1,045,000
 FY 87: sum (\$70,132 to \$15,308) = \$513,000
 FY 88: \$10,324 + \$5,340 = \$16,000
 FY 89 - FY 05: = \$0

TABLE A-7

BAQ + VHA ALLOWANCES COST SCHEDULE
RENT GUARANTEE (802) & ALLOWANCES PROGRAM

<u>Fiscal Year</u>	<u>Total Monthly Cost</u>	<u>Length of Operation (Months)</u>	<u>Annual Expenditure</u>
1986-2005	\$89,000	12	\$1,068,000

g. BAQ/VHA (MCA, BTL). Under these alternatives, allowance payments will gradually decline as new housing becomes occupied. Total weighted monthly allowance costs were calculated in table A-8. Division of total monthly cost by number of units provided a weighted monthly allowance cost/unit: $\$89,000 \div 250 \text{ units} = \$356/\text{unit}$. As each new unit becomes available for occupancy, average allowance payments will decline by \$356. Table A-8 also provides a schedule of the declining allowance costs.

h. Maintenance and Repair (MCA, BTL). M&R costs were assumed to be equal to existing onpost housing M&R expenses. Based on FY 1984 command operating budget data at Fort Lewis, annual M&R expenditures would finally amount to \$1,164/unit. Table A-9 shows that maintenance would cost \$280/unit (\$70,000 total), while repairs would cost \$884/unit (\$221,000 total). It was assumed that no maintenance costs would occur the first year of occupancy, only maintenance would take place between years 2 through 5, and repair costs would begin during year 6. Due to the monthly addition of units during construction, M&R costs would increase incrementally during years 2 and 3 as well as years 6 and 7. A monthly schedule of occupied units, type of maintenance involved, and cost of maintenance (at 100 percent occupancy) produced annual M&R cost information (table A-10).

A-22

CUMULATIVE
NET DISC
P.V.

YEAR

1986	\$3,713,449
1987	\$14,892,797
1988	\$17,602,285
1989	\$17,833,666
1990	\$18,044,604
1991	\$18,239,440
1992	\$18,475,711
1993	\$18,740,899
1994	\$18,983,314
1995	\$19,203,691
1996	\$19,404,033
1997	\$19,586,163
1998	\$19,751,735
1999	\$19,902,256
2000	\$20,039,093
2001	\$20,163,490
2002	\$20,276,578
2003	\$20,379,386
2004	\$20,472,847
2005	\$20,557,812

UNIFORM ANNUAL EQUIVALENT = \$2,414,712 (10% DISCOUNT RATE, 20 YEARS)

S U M M A R Y O F C O S T S F O R E C O N O M I C A N A L Y S I S
R E P O R T B Y Y E A R

FAMILY HOUSING ECONOMIC ANALYSIS
FORT LEWIS, WASHINGTON
SEATTLE DISTRICT
ARMY CORPS OF ENGINEERS
(206) 764-3646

RENT GUARANTEE PROGRAM (802)

1. SUBMITTING ORGANIZATION

FORT LEWIS, WASHINGTON

2. DATE OF SUBMISSION

NOVEMBER 1984

3. PROJECT TITLE

ECONOMIC ANALYSIS OF FAMILY HOUSING

A. DESCRIPTION OF PROGRAM OBJECTIVE

DETERMINE LEAST-COST ALTERNATIVE TO GOVERNMENT TO PROVIDE SSC HOUSING UNITS

B. ALTERNATIVE

GUARANTEE (802)

6. ECONOMIC LIFE

7. PERIOD OF ANALYSIS

60 YEARS

8. ANALYST

9. DOWNSIDE (802)

S U M M A R Y O F C O S T S F O R E C O N O M I C A N A L Y S I S
R E P O R T B Y Y E A R

FAMILY HOUSING ECONOMIC ANALYSIS
FORT LEWIS, WASHINGTON
SEATTLE DISTRICT
ARMY CORPS OF ENGINEERS
(206) 764-3646

ALLOWANCES

1. SUBMITTING ORGANIZATION

FORT LEWIS, WASHINGTON

2. DATE OF SUBMISSION

NOVEMBER 1984

3. PROJECT TITLE

ECONOMIC ANALYSIS OF FAMILY HOUSING

4. DESCRIPTION OF PROGRAM OBJECTIVE

EVALUATE LEAD-LEASE ALTERNATIVE TO GOVERNMENT TO PROVIDE 250 HOUSING UNITS

5. AIDES AIDED

ALLOWANCES

6. ECONOMIC LIFE

7. PERIOD OF ANALYSIS

1984-86

YEAR	BAG/VHA ALLOWANCES (802,ECON) (06)	TOTAL ANNUAL OUTLAYS	DISCOUNTED PRESENT VALUE	CUMULATIVE NET DISC P.V.
1986	\$1,068,000	\$1,068,000	\$1,018,298	\$1,018,298
1987	\$1,068,000	\$1,068,000	\$925,725	\$1,944,023
1988	\$1,068,000	\$1,068,000	\$841,568	\$2,785,592
1989	\$1,068,000	\$1,068,000	\$765,062	\$3,550,654
1990	\$1,068,000	\$1,068,000	\$695,511	\$4,246,165
1991	\$1,068,000	\$1,068,000	\$632,282	\$4,878,448
1992	\$1,068,000	\$1,068,000	\$574,802	\$5,453,251
1993	\$1,068,000	\$1,068,000	\$522,547	\$5,975,799
1994	\$1,068,000	\$1,068,000	\$475,043	\$6,450,842
1995	\$1,068,000	\$1,068,000	\$431,857	\$6,882,700
1996	\$1,068,000	\$1,068,000	\$392,597	\$7,275,298
1997	\$1,068,000	\$1,068,000	\$356,907	\$7,632,205
1998	\$1,068,000	\$1,068,000	\$324,461	\$7,956,667
1999	\$1,068,000	\$1,068,000	\$294,964	\$8,251,631
2000	\$1,068,000	\$1,068,000	\$268,149	\$8,519,781
2001	\$1,068,000	\$1,068,000	\$243,772	\$8,763,553
2002	\$1,068,000	\$1,068,000	\$221,611	\$8,985,165
2003	\$1,068,000	\$1,068,000	\$201,464	\$9,186,630
2004	\$1,068,000	\$1,068,000	\$183,149	\$9,369,779
2005	\$1,068,000	\$1,068,000	\$166,499	\$9,536,279

UNIFORM ANNUAL EQUIVALENT = \$1,120,127 (10% DISCOUNT RATE, 20 YEARS)

APPENDIX B

AFFECT OF REVERSIONARY CLAUSE

Opinion Regarding Real Estate Aspects of Section 801 Housing at or Near
Fort Lewis, Washington

1. Section 801 of P.L. 98-115 (copy attached) authorizes the Secretary to enter into a contract for the lease of family housing units to be constructed on or near a military installation at which there is a validated deficit in family housing. Such contract would provide that the United States is to make lease payments, not the individuals occupying such quarters. Such housing units are then assigned, without rental charge, to members of the armed forces who are eligible for assignment to military family housing. The contract to lease such properties cannot exceed 20 years (excluding the proof required for construction of the housing facilities), and must provide that the United States shall have the right of first refusal to acquire all right, title, and interest to the housing facilities constructed and leased under the contract.

2. If Section 801 housing were to be constructed near a military installation, on privately owned land, the developer constructing the family housing would have to obtain the site for the housing. It would seem likely that the developer would purchase the site in fee, since financing probably would be more readily available to him if he held fee title. The language of Section 801, however, does not require that such housing be built on fee owned lands, and it would appear that the same arrangement could be established where the developer obtained only a long term ground lease. Such a ground lease would have to be for at least 20 years to take advantage of the maximum term of the Government's contract to lease the housing units constructed on the site. Obviously, unless the developer purchased the privately owned site in fee, or obtained a ground lease for a period substantially longer than 20 years, he would have little left to sell to the Government at the end of 20 years. Anything less would, in actuality, make any provision affording the Government the right of first refusal a meaningless provision. It is concluded, therefore, that an economic analysis of Section 801 housing to be constructed near a military installation and on private land, should reflect that the developer either acquires fee title to the site, or holds a ground lease with a term at least equal to the economic life of the Section 801 housing to be constructed thereon. Further, the economic analysis should reflect a firm commitment on the part of the United States to make lease payments for a period of up to 20 years. Beyond that period, the developer would have no commitment from the United States to enter into a further leasing arrangement; however, this does not mean that a further leasing arrangement by the United States would be prohibited, only that possible further leasing of the housing units by the United States after the 20 year period would be speculative. On the other hand, after the period of the 20 year lease arrangement by the United States, the developer would be free to lease the housing units to the general public without limitation, since the units would be located off the military reservation on privately owned land. The economic analysis, therefore, should reflect the expectation of such rental income after the 20 year lease arrangement with the United States.

3. If Section 801 housing were to be constructed on a military installation, it would appear that the developer would be limited to acquiring the site from the Government by lease. The developer would then construct the family housing units and lease them to the Government. The developer would own the housing units, but would not own the lands upon which they were built. Any leasing of the lands on a military installation for Section 801 housing apparently would have to be made under the authority of 10 U.S.C. 2667, which provides, in part, that such lease must contain a provision whereby the Secretary shall be permitted to revoke the lease at any time unless he determines that the omission of such a provision will promote the national defense or be in the public interest. It is considered that a lease of a site on a military installation for construction and maintenance of housing units for members of the armed forces for a term of 20 years (excluding the period required for construction of the housing facilities) would clearly be a proper basis for omitting the provision permitting revocation of the lease. If the lease were made for a term longer than 20 years, however, there would appear to be little justification for eliminating such right of revocation after the expiration of the first 20 years of such longer lease term. It is therefore considered that any lease of a site on a military installation for constructing Section 801 housing could be for a firm term of up to 20 years (excluding the period required for construction of the housing facilities), but that the Secretary would have to retain the right to revoke the lease at any time after such 20 year period.

4. The situation with regard to constructing Section 801 housing on Fort Lewis, Washington, is further complicated by the fact that the bulk of the lands which comprise Fort Lewis, and particularly those lands within the developed areas of Fort Lewis, were donated to the United States by Pierce County, Washington. The deed of conveyance expressly provided that if the United States should ever cease to use the lands conveyed to it by the County for "military uses, including supply stations, the mobilization, disciplining, and training of the United States Army, State Militia, or other military organizations as are now or may thereafter be authorized or provided by Federal law", then all right, title, and interest to the lands will automatically revert to the County. It is considered that a ground lease to a Section 801 developer who would construct family housing for occupancy only by members of the armed forces would not trigger the reversion. Such use can reasonably be interpreted as a military use of the lands. Under a Section 801 housing arrangement, no problem would exist for the first 20 year term of the ground lease, since the lease arrangement between the United States and the developer would limit use of such housing to military family housing. After the expiration of that 20 year period, however, the Section 801 developer could not be allowed to rent the housing units on the installation to the general public. It is considered that such a use would not be a military use, as set forth in the reversionary provision of the deed from the county, and that rental of the housing units to the general public would serve to trigger a reversion of the lands to the county. Notwithstanding such limitation on the Government's title to the lands, it would also seem that there would be policy objections to having housing for the general public on a military installation.

5. In summary, regarding Section 801 housing on Fort Lewis, it is concluded that a ground lease could be made of the site for such housing, and that such lease could be made to the developer without a rental charge. The lease could run for more than 20 years, however, the firm term of the lease would be for only 20 years (plus the period required for construction of the housing). Occupancy of the housing would have to be limited to families of members of the armed forces, but a firm commitment for such family housing could only be for the 20 year period. Thereafter, the lease would have to be revocable at will by the Secretary. Further, a possibility would exist that the United States might again enter into a leasing arrangement for the housing units after the 20 year period and before the expiration of the ground lease, but it is speculative as to whether any leasing arrangement with the United States would actually take place. In no event could the Section 801 developer lease such housing units constructed on Fort Lewis to the general public after the expiration of the 20 year period. In making an economic analysis of Section 801 housing on Fort Lewis, therefore, consideration should reflect that the ground lease to the developer for the site would be without the payment of rent, but should also reflect that the income stream from the property is firm only for the 20 year term, and that continuation of the income stream thereafter would be speculative, since income after the 20 year period would be wholly dependent on whether the United States would enter into a further leasing arrangement. The developer, after the 20 year period, would have a lease revocable at will, and which might or not be leased for a further term by the United States. In any event, he would not be free to lease to the general public.


GEORGE GREGORY MOEN
Chief, Real Estate Division

APPENDIX C

HOUSING PROGRAM GUIDELINES

(6) The maximum rental per year for family housing facilities, or for real property related to family housing facilities, leased in a foreign country under section 2828(f) of title 10, United States Code, is \$250,000.

EFFECTIVE DATE FOR PROJECT AUTHORIZATIONS

Sec. 609. Titles I, II, III, IV, and V of this Act shall take effect on October 1, 1983.

TITLE VII—GUARD AND RESERVE FORCES FACILITIES

AUTHORIZATION FOR FACILITIES

10 USC 2231 et
seq.

SEC. 701. There are authorized to be appropriated for fiscal years beginning after September 30, 1983, for the costs of acquisition, architectural and engineering services, and construction of facilities for the Guard and Reserve Forces, and for contributions therefor, under chapter 133 of title 10, United States Code (including the cost of acquisition of land for those facilities), the following amounts:

- (1) For the Department of the Army—
 - (A) for the Army National Guard of the United States, \$66,826,000; and
 - (B) for the Army Reserve, \$54,700,000.
- (2) For the Department of the Navy, for the Naval and Marine Corps Reserves, \$28,245,000.
- (3) For the Department of the Air Force—
 - (A) for the Air National Guard of the United States, \$108,620,000; and
 - (B) for the Air Force Reserve, \$41,200,000.

MODIFICATION OF GUARD AND RESERVE MINOR CONSTRUCTION AUTHORITY

Effective date.

SEC. 702. Effective on October 1, 1983, section 2232a(a)(1) of title 10, United States Code, is amended by striking out "\$200,000" and inserting in lieu thereof "\$400,000".

TITLE VIII—GENERAL PROVISIONS

MILITARY FAMILY HOUSING LEASING PROGRAM

Validated
deficit.

SEC. 801. Section 2828 of title 10, United States Code, is amended by adding at the end thereof the following subsection:

"(g)(1) Notwithstanding any other provision of law, the Secretary of a military department may enter into a contract for the lease of family housing units to be constructed on or near a military installation within the United States under the Secretary's jurisdiction at which there is a validated deficit in family housing. Housing units leased under this subsection shall be assigned, without rental charge, as family housing to members of the armed forces who are eligible for assignment to military family housing. A contract under this section shall include a provision that the obligation of the United States to make payments under the contract in any fiscal year is subject to the availability of appropriations for that purpose.

"(2) Each contract under paragraph (1) shall be awarded through the use of publicly advertised, competitively bid or competitively

negotiated contracting procedures. Such a contract may provide for the contractor of the housing facilities to operate and maintain such housing facilities during the term of the lease.

"(3) Each contract under this subsection shall require that housing units constructed pursuant to the contract shall be constructed to Department of Defense specifications.

"(4) A contract under this subsection may be for any period not in excess of 20 years (excluding the period required for construction of the housing facilities).

Contract time
limitation

"(5) A contract under this subsection shall provide that, upon the termination of the lease period, the United States shall have the right of first refusal to acquire all right, title, and interest to the housing facilities constructed and leased under the contract.

First refusal
right

"(6) A contract may not be entered into for the lease of housing facilities under this subsection until—

"(A) the Secretary of Defense submits to the appropriate committees of Congress, in writing, an economic analysis (based upon accepted life cycle costing procedures) which demonstrates that the proposed contract is cost effective when compared with alternative means of furnishing the same housing facilities; and

Economic
analysis
submitted to
congressional
committees

"(B) a period of 21 calendar days has expired following the date on which the economic analysis is received by those committees.

"(7) This subsection may be implemented only by a pilot program. In carrying out such pilot program—

Pilot program

"(A) the Secretary of each military department may not enter into more than two contracts under this subsection; and

"(B) any such contract may not be for more than 300 family housing units.

"(8) A contract may not be entered into under this subsection after October 1, 1985."

MILITARY HOUSING RENTAL GUARANTEE PROGRAM

Sec. 802. (a) The Secretary of a military department, under uniform regulations prescribed by the Secretary of Defense, may enter into an agreement to assure the occupancy of rental housing to be constructed by a private developer or by a State or local housing authority on private land, on land owned by a State or local government, or on land owned by the United States, if the housing is to be located on or near a new military installation or an existing military installation that has a shortage of housing to meet the requirements of eligible members of the Armed Forces (with or without accompanying dependents). An agreement under this section shall include a provision that the obligation of the United States to make payments under the agreement in any fiscal year is subject to the availability of appropriations for that purpose.

10 USC 2821
note

(b) An agreement under subsection (a)—

Payments
provision

(1) may not assure the occupancy of more than 97 percent of the units constructed under the agreement;

Agreement
conditions

(2) shall establish initial rental rates that are not more than rates for comparable rental dwelling units in the same general market area and may include an escalation clause for operation and maintenance costs which shall (if included) be effective for the term of agreement;

(3) may not apply to existing housing;

(4) shall require that the housing units be constructed to Department of Defense specifications;

(5) may not be for a term in excess of 15 years;

(6) may not be renewed;

(7) may not assure more than an amount equivalent to the shelter rent of the housing units, determined on the basis of amortizing initial construction costs;

(8) may only be entered into to the extent that there is a validated deficit in military family housing;

(9) may only be entered into if existing military-controlled housing at all installations in the commuting area (except for a new installation or an installation for which there is projected a significant increase in the number of families due to an increase in the number of authorized personnel) has exceeded 97 percent use for a period of not less than 18 consecutive months immediately preceding the date on which the agreement is entered into, excluding units temporarily inactivated for major repair or improvements;

(10) shall provide for priority of occupancy for military families; and

(11) shall include a clause rendering the agreement null and void if, in the opinion of the Secretary of the military department concerned, the owner of the housing fails to maintain a satisfactory level of operation and maintenance.

(c) An agreement under subsection (a) shall be made through the use of publicly advertised, competitively bid or competitively negotiated procedures.

(d) An agreement may not be entered into under subsection (a) until—

Economic analysis submitted to congressional committees.

(1) the Secretary of Defense submits to the appropriate committees of Congress, in writing, an economic analysis (based upon accepted life cycle costing procedures) which demonstrates that the proposed agreement is cost effective when compared with alternative means of furnishing the same housing facilities; and

(2) a period of 21 calendar days has expired following the date on which the economic analysis is received by those committees.

(e) The Secretary concerned may require that disputes arising under an agreement entered into under subsection (a) be decided in accordance with the procedures provided for by the Contract Disputes Act of 1978 (41 U.S.C. 601 et seq.).

Pilot program

(f) This section may be implemented only by a pilot program. In carrying out such pilot program—

(1) the Secretary of each military department may not enter into more than two agreements under this section; and

(2) the Secretary of a military department may not enter into such an agreement for more than 300 family housing units at one location.

(g) An agreement may not be entered into under this section after September 30, 1985.

FAMILY HOUSING CONSTRUCTED OVERSEAS

10 USC 2821 note

SEC. 803. (a) The Secretary of Defense shall ensure that any contract entered into for the construction of military family housing for the Department of Defense in a foreign country shall require the

APPENDIX D

DD FORMS 1377, 1378, AND 1379

TABLE D-1

TABULATION OF FAMILY HOUSING SURVEY					REPORT CONTROL SYMBOL		
DATE OF SURVEY		OFFICERS A	ELIGIBLE ENLISTED B	CIVILIANS C	SUBTOTAL (A+B+C) D	OTHER ENLISTED E	TOTAL (D+E) F
30 Sep 83							
REQUIREMENTS	2 TOTAL PERSONNEL STRENGTH	2906	12972	5880	21758	8555	30313
	3 PERMANENT PARTY HOUSING STRENGTH AND KEY CIVILIANS	2906	12972	0	15878	8555	24433
	4 NUMBER OF FAMILIES	2166	8389	0	10555	2366	12921
	5 HOUSING REQUIREMENTS FACTOR	74.5	64.7	0	66.5	27.7	50.9
NOT LIVING WITH FAMILY IN AREA	6 NOT LIVING WITH FAMILY (TOTAL 7-10)	83	1164	0	1247	602	1849
	7 INVOLUNTARILY SEPARATED FAMILIES	13	306	0	319	243	562
	8 (PREFER MILITARY QUARTERS)	4	114	0	118	118	236
	9 (PREFER PRIVATE HOUSING)	9	192	0	201	82	283
LIVING WITH FAMILY IN AREA	10 VOLUNTARILY SEPARATED FAMILIES	70	858	0	928	359	1287
	11 LIVING WITH FAMILY IN AREA (TOTAL 12-15)	2083	7225	0	9308	1734	11042
	12 SUITABLY HOUSED SUBTOTAL 12-15	1993	6469	0	8462	1476	9938
	13 IN MILITARY CONTROLLED HOUSING	747	2556	0	3303	1	3304
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	14 (PREFER RENTING OFF POST)	20	92	0	112	0	112
	15 (PREFER OWNING OFF POST)	141	491	0	632	1	633
	16 IN PRIVATE HOUSING	1246	3913	0	5159	1475	6634
	17 (PREFER MILITARY QUARTERS)	156	738	0	894	427	1321
LIVING WITH FAMILY IN AREA	18 (PREFER RENTING OFF POST)	109	1394	0	1503	830	2333
	19 UNSUITABLY HOUSED SUBTOTAL 20-23	90	756	0	846	258	1104
	20 IN MILITARY CONTROLLED HOUSING	0	0	0	0	0	0
	21 (PREFER RENTING OFF POST)	0	0	0	0	0	0
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	22 (PREFER OWNING OFF POST)	0	0	0	0	0	0
	23 PRIVATE HOUSING SUBTOTAL 24-27	90	756	0	846	258	2333
	24 (PREFER MILITARY QUARTERS)	39	362	0	401	145	546
	25 (PREFER RENTING OFF POST)	17	180	0	197	87	284
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	26 EXCESS DISTANCE	3	81	0	84	22	106
	27 SUBSTANDARD	87	675	0	762	236	998
	28 EXCESS COST ONLY (ON POST)	0	0	0	0	0	0
	29 LESS THAN 85	0	0	0	0	0	0
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	30 85 TO 90	0	0	0	0	0	0
	31 90 TO 95	0	0	0	0	0	0
	32 95 TO 99	0	0	0	0	0	0
	33 99 AND MORE	0	0	0	0	0	0
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	34 NUMBER OCCUPIED HOUSES TOTAL 35-38	935	1162	0	2097	0	2097
	35 SUITABLE IN ALL RESPECTS	929	1132	0	2061	0	2061
	36 UNSUITABLE SUBTOTAL 37-38	6	30	0	36	0	36
	37 EXCESS DISTANCE	3	15	0	18	0	18
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	38 SUBSTANDARD	3	15	0	18	0	18
	39 EXCESS COST ONLY	0	0	0	0	0	0
	40 NUMBER OCCUPIED HOUSES TOTAL 41-42	12	154	0	166	0	166
	41 SUITABLE IN ALL RESPECTS (ON POST)	12	154	0	166	0	166
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	42 UNSUITABLE SUBTOTAL 43-45	0	0	0	0	0	0
	43 EXCESS DISTANCE	0	0	0	0	0	0
	44 SUBSTANDARD	0	0	0	0	0	0
	45 EXCESS COST ONLY (ON POST)	0	0	0	0	0	0
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	46 IN RENTED HOUSING OFF POST (TOTAL 47-48)	389	3353	0	3742	1733	5475
	47 SUITABLE IN ALL RESPECTS	305	2627	0	2932	1475	4407
	48 UNSUITABLE (SUBTOTAL 49-51)	84	726	0	810	258	1068
	49 EXCESS DISTANCE	0	66	0	66	22	88
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	50 SUBSTANDARD	84	660	0	744	236	980
	51 EXCESS COST ONLY	0	0	0	0	0	0
	52 IN MILITARY CONTROLLED HOUSING (TOTAL 53-57)	747	2556	0	3303	1	3304
	53 ADEQUATE AS PUBLIC QUARTERS (VACANT)	747	2556	0	3303	1	3304
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	54 MILITARY OWNED (VACANT)	747	2556	0	3303	1	3304
	55 MILITARY LEASED (VACANT)	0	0	0	0	0	0
	56 MILITARY OWNED (VACANT)	0	0	0	0	0	0
	57 ADEQUATE AS PUBLIC QUARTERS (VACANT)	0	0	0	0	0	0
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	58 VACANT HOUSING TOTAL 59-61	49	293	0	342	77	419
	59 PRIVATE RENTAL HOUSING	38	209	0	247	77	324
	60 FRA AND VA HELD RENTAL HOUSING	0	0	0	0	0	0
	61 MILITARY HOUSING ADEQUATE AS PUBLIC QUARTERS	11	79	0	90	0	90
SUMMARY OF OCCUPIED HOUSING BY TYPE AND PREFERENCE	62 NUMBER OF UNSUITABLE UNITS INSPECTED	1	12	0	13	15	28
	63 NUMBER OF INSPECTED UNITS RECLASSIFIED	1	6	0	7	4	11
	64 ADJUSTMENT FACTORS						
	65 NAME AND LOCATION OF INSTALLATION						

TABULATION OF FAMILY HOUSING SURVEY

QUALITATIVE ANALYSIS OF REQUIREMENTS AND ASSETS	EFFECTIVE REQUIREMENTS		SUITABLE HOUSING		TOTAL (11-6)	DEFICIT
	NUMBER	PERCENT	W/L CONTROL	OFF POST		
66 D 10 THROUGH D 8	94	1.0 %	50	40	90	4
67 1 OR 2 BEDROOMS	24	.3 %	0	10	10	14
68 3 BEDROOMS	43	.4 %	0	19	19	24
69 4 OR MORE BEDROOMS	27	.3 %	50	11	61	- 34
70 D 5 AND D 4	590	6.1 %	190	368	558	32
71 1 OR 2 BEDROOMS	196	2.0 %	0	126	126	70
72 3 BEDROOMS	233	2.4 %	111	143	254	- 21
73 4 OR MORE BEDROOMS	161	1.7 %	79	99	178	- 17
74 D 3 THROUGH D 1 AND D 4 THROUGH D 1	1412	14.7 %	642	876	1518	- 106
75 1 OR 2 BEDROOMS	1042	10.8 %	254	659	913	129
76 3 BEDROOMS	236	2.5 %	348	139	487	- 251
77 4 OR MORE BEDROOMS	134	1.4 %	40	78	118	16
78 ALL OFFICER GRADES (TOTAL 66-70-74)	2096	21.8 %	882	1284	2166	- 70
79 1 OR 2 BEDROOMS	1262	13.1 %	795	795	1049	213
80 3 BEDROOMS	512	5.3 %	459	301	760	- 248
81 4 OR MORE BEDROOMS	322	3.4 %	169	188	357	- 35
82 E 3 THROUGH E 7	1198	12.5 %	421	723	1144	54
83 1 OR 2 BEDROOMS	440	4.6 %	0	297	297	143
84 3 BEDROOMS	393	4.1 %	419	238	657	- 264
85 4 OR MORE BEDROOMS	365	3.8 %	2	188	190	175
86 E 8 THROUGH E 8 (E 8 Light)	6333	65.8 %	2091	3399	5490	- 843
87 1 OR 2 BEDROOMS	4725	49.1 %	246	2685	2931	1794
88 3 BEDROOMS	1181	12.3 %	1615	540	2155	- 974
89 4 OR MORE BEDROOMS	427	4.4 %	230	174	404	23
90 ALL E 8 OR E 8 LIGHT TOTAL E 8	7531	78.2 %	2512	4122	6634	897
91 1 OR 2 BEDROOMS	5165	53.7 %	246	2982	3228	1937
92 3 BEDROOMS	1574	16.3 %	2034	778	2812	- 1238
93 4 OR MORE BEDROOMS	792	8.2 %	232	362	594	198
94 ALL E 8 OR E 8 LIGHT TOTAL E 8	9627	100.0 %	3394	5408	8802	827
95 1 OR 2 BEDROOMS	6427	66.8 %	500	3777	4277	2150
96 3 BEDROOMS	2086	21.6 %	2492	1079	3572	- 1486
97 4 OR MORE BEDROOMS	1114	11.6 %	401	550	951	163
98 SPECIALS EQUIVALENT	0	0 %	0	0	0	0
99 1 OR 2 BEDROOMS	0	0 %	0	0	0	0
100 3 BEDROOMS	0	0 %	0	0	0	0
101 4 OR MORE BEDROOMS	0	0 %	0	0	0	0
102 SPECIALS EQUIVALENT	0	0 %	0	0	0	0
103 1 OR 2 BEDROOMS	0	0 %	0	0	0	0
104 3 BEDROOMS	0	0 %	0	0	0	0
105 4 OR MORE BEDROOMS	0	0 %	0	0	0	0
106 ALL E 8 OR E 8 LIGHT TOTAL E 8	9627	100.0 %	3394	5408	8802	827
107 1 OR 2 BEDROOMS	6427	66.8 %	500	3777	4277	2150
108 3 BEDROOMS	2086	21.6 %	2492	1079	3572	- 1486
109 4 OR MORE BEDROOMS	1114	11.6 %	401	550	951	163
110 E 8 AND E 8 LIGHT THROUGH E 8	1977	20.5 %	1552	1552	1552	425
111 1 OR 2 BEDROOMS	1779	18.3 %	1422	1422	1422	357
112 3 BEDROOMS	182	1.9 %	130	130	130	52
113 4 OR MORE BEDROOMS	16	.2 %	0	0	0	16
114 REMARKS:						

TABLE D-2

DETERMINATION OF HOUSING REQUIREMENTS AND PROJECT COMPOSITION								REPORT CONTROL SYMBOL DD I & L (A) 665	
DERIVATION OF LONG-RANGE HOUSING REQUIREMENTS	OFFICERS		ENLISTED MEN				CIVILIANS	TOTAL (a + b)	
	OPERATIONAL a	STUDENTS b	OPERATIONAL		STUDENTS				
			ELIGIBLE c	OTHER d	ELIGIBLE e	OTHER f			
1 TOTAL PERSONNEL STRENGTH	3339	70	14010	9256	220	38	3720	30653	
2 PERMANENT PARTY HOUSING STRENGTH	3339	70	14010	9256	80	28	0	26783	
3 HOUSING REQUIREMENTS FACTOR	75.3 %	95.0 %	63.6 %	27.5 %	53.1 %	43.9 %	0	52.6	
4 GROSS HOUSING REQUIREMENTS	2514	67	8910	2545	42	12	0	14050	
DERIVATION OF LONG-RANGE HOUSING DEFICIT									
	OFFICERS	ELIGIBLE ENLISTED	KEY CIVILIANS	SUB-TOTAL (c + e)		OTHER ENLISTED	TOTAL		
5 GROSS ELIGIBLE HOUSING REQUIREMENTS	2581	8952	0	11533	NO %	2557	14090		
6 VOLUNTARILY SEPARATED FAMILIES	83	916	0	999	8.7	385	1385		
7 EFFECTIVE HOUSING REQUIREMENTS (5 minus 6)	2498	8036	0	10534	91.3	2169	12705		
8 (Programming Limit) %	2248	7232	0	9480	82.2	1952	11432		
9 SUITABLE HOUSING ASSETS (Form D-10)	2166	7000	0	9166	79.5	1550	10716		
10 MILITARY CONTROLLED ASSETS (Subtotal 11-15)	882	2877	0	3759	32.6		3759		
11 MILITARY OWNED - EXISTING	882	2512	0	3394	29.4		3394		
12 MILITARY OWNED - UNDER CONTRACT	0	115	0	115	1.0		115		
13 MILITARY OWNED - APPROVED	0	0	0	0	0		0		
14 MILITARY LEASED - EXISTING AND APPROVED	0	0	0	0	0		0		
15 OTHER (Specify)	0	250	0	250	2.2		250		
16 NOT MILITARY CONTROLLED (Subtotal 17-21)	1284	4123	0	5407	46.9	1550	5407		
17 CURRENTLY OCCUPIED - OWNED	941	1286	0	2227	19.3	0	2227		
18 CURRENTLY OCCUPIED - RENTED	305	2627	0	2932	25.4	1475	2932		
19 CURRENTLY VACANT - PRIVATE FOR RENT	38	209	0	247	2.1	75	247		
20 CURRENTLY VACANT - FHA AND VA FOR RENT	0	0	0	0	0	0	0		
21 UNDER CONSTRUCTION OR FIRMLY PLANNED	0	1	0	1	0	0	1		
22 NET HOUSING DEFICIT (7 minus 9)	332	1036	0	1368	11.9	619	1957		
23 (Programming Deficit) (5 minus 9)	82	232	0	314	2.7	402	726		
PROPOSED HOUSING INCREMENTS AND PROGRAMMING LEVELS									
FISCAL YEAR 19	24 NEW CONSTRUCTION								
	25 OTHER (Specify)								
	26 MILITARY PROGRAMMING LEVEL NO (P-24-25)								
	27 MILITARY PROGRAMMING LEVEL PERCENT								
	28 TOTAL PROGRAMMING LEVEL NO (26+27)								
FISCAL YEAR 20	29 NEW CONSTRUCTION								
	30 OTHER (Specify)								
	31 MILITARY PROGRAMMING LEVEL NO (P-29-30)								
	32 MILITARY PROGRAMMING LEVEL PERCENT								
	33 TOTAL PROGRAMMING LEVEL NO (31+32)								
FISCAL YEAR 21	34 NEW CONSTRUCTION								
	35 OTHER (Specify)								
	36 MILITARY PROGRAMMING LEVEL NO (P-34-35)								
	37 MILITARY PROGRAMMING LEVEL PERCENT								
	38 TOTAL PROGRAMMING LEVEL NO (36+37)								
FISCAL YEAR 22	39 NEW CONSTRUCTION								
	40 OTHER (Specify)								
	41 MILITARY PROGRAMMING LEVEL NO (P-39-40)								
	42 MILITARY PROGRAMMING LEVEL PERCENT								
	43 TOTAL PROGRAMMING LEVEL NO (41+42)								
FISCAL YEAR 23	44 NEW CONSTRUCTION								
	45 OTHER (Specify)								
	46 MILITARY PROGRAMMING LEVEL NO (P-44-45)								
	47 MILITARY PROGRAMMING LEVEL PERCENT								
	48 TOTAL PROGRAMMING LEVEL NO (46+47)								
FISCAL YEAR 24	49 NEW CONSTRUCTION								
	50 OTHER (Specify)								
	51 MILITARY PROGRAMMING LEVEL NO (P-49-50)								
	52 MILITARY PROGRAMMING LEVEL PERCENT								
	53 TOTAL PROGRAMMING LEVEL NO (51+52)								
54 NAME AND LOCATION OF INSTALLATION									

DD FORM 1378

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

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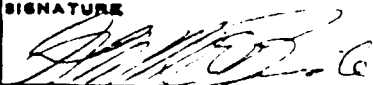
DETERMINATION OF HOUSING REQUIREMENTS AND PROJECT COMPOSITION

QUALITATIVE ANALYSIS OF REQUIREMENTS	REQUIREMENTS			SUITABLE HOUSING			PROGRAM DEFICIT (c Minus f)	FISCAL YEAR 19 PROJECT
	EFFECTIVE a	PERCENT b	PROGRAM LIMIT c	MILITARY CONTROL d	OFF POST e	TOTAL (d + e)		
53 0 - 10 THROUGH 0 - 8	112	1.1 %	101	50	40	90	11	
54 1 AND 2 BEDROOMS	29	.3 %	26	0	10	10	16	
57 3 BEDROOMS	51	.5 %	46	0	19	19	27	
58 4 OR MORE BEDROOMS	32	.3 %	29	0	11	61	- 32	
59 0 - 3 AND 0 - 4	703	6.6 %	633	190	353	553	75	
60 1 AND 2 BEDROOMS	233	2.2 %	210	0	126	126	84	
61 3 BEDROOMS	278	2.6 %	250	111	143	254	- 4	
62 4 OR MORE BEDROOMS	192	1.8 %	173	79	99	178	- 5	
63 0 - 3 - 0 - 1 AND 0 - 4 - 0 - 1	1683	16.0 %	1514	642	876	1518	- 4	
64 1 AND 2 BEDROOMS	1242	11.8 %	1117	254	659	913	204	
65 3 BEDROOMS	281	2.7 %	253	348	139	487	- 234	
66 4 OR MORE BEDROOMS	160	1.5 %	144	40	78	118	26	
67 OFFICERS - TOTAL	2498	23.7 %	2248	882	1284	2166	82	
68 1 AND 2 BEDROOMS	1504	14.3 %	1353	254	759	1049	304	
69 3 BEDROOMS	610	5.8 %	549	459	301	760	- 211	
70 4 OR MORE BEDROOMS	384	3.6 %	346	169	188	357	- 11	
71 E - 9 - E - 7	1278	12.1 %	1150	444	723	1167	- 17	
72 1 AND 2 BEDROOMS	469	4.4 %	422	0	297	297	125	
73 3 BEDROOMS	420	4.0 %	378	419	238	657	- 279	
74 4 OR MORE BEDROOMS	389	3.7 %	350	25	188	213	137	
75 E - 8 - E - 4 (Eligible)	6758	64.2 %	6082	2433	3400	5833	249	
76 1 AND 2 BEDROOMS	5042	47.9 %	4538	588	2686	3274	1264	
77 3 BEDROOMS	1260	12.0 %	1134	1615	540	2155	-1021	
78 4 OR MORE BEDROOMS	456	4.3 %	410	230	174	404	6	
79 ALL ELIGIBLE ENLISTED	8036	76.3 %	7232	2877	4123	7000	232	
80 1 AND 2 BEDROOMS	5511	52.3 %	4960	589	2993	3571	1399	
81 3 BEDROOMS	1680	16.0 %	1512	2034	778	2812	-1300	
82 4 OR MORE BEDROOMS	845	8.0 %	760	255	362	617	143	
83 ALL ELIGIBLE MILITARY	10534	100.0 %	9480	3759	5407	9166	314	
84 1 AND 2 BEDROOMS	7015	66.6 %	6313	842	3788	4620	1693	
85 3 BEDROOMS	2290	21.8 %	2061	2493	1079	3572	-1511	
86 4 OR MORE BEDROOMS	1229	11.6 %	1106	424	550	974	132	
87 KEY CIVS. - 0 EQUIVALENT	0	0 %	0	0	0	0	0	
88 1 AND 2 BEDROOMS	0	0 %	0	0	0	0	0	
89 3 BEDROOMS	0	0 %	0	0	0	0	0	
90 4 OR MORE BEDROOMS	0	0 %	0	0	0	0	0	
91 KEY CIVS. - E EQUIVALENT	0	0 %	0	0	0	0	0	
92 1 AND 2 BEDROOMS	0	0 %	0	0	0	0	0	
93 3 BEDROOMS	0	0 %	0	0	0	0	0	
94 4 OR MORE BEDROOMS	0	0 %	0	0	0	0	0	
95 ALL ELIGIBLE CATEGORIES	10534	100%	9480	3759	5407	9166	314	
96 1 AND 2 BEDROOMS	7015	66.6 %	6313	842	3778	4620	1693	
97 3 BEDROOMS	2290	21.8 %	2061	2493	1079	3572	-1511	
98 4 OR MORE BEDROOMS	1229	11.6 %	1106	424	550	974	132	
99 E - 4 (Eligible) - E - 1	2169	100%	1952		1552	1552	400	
100 1 AND 2 BEDROOMS	1951	90.0 %	1756		1422	1422	334	
101 3 BEDROOMS	200	9.2 %	180		130	130	50	
102 4 OR MORE BEDROOMS	18	.8 %	16		0	0	16	
103 REMARKS (If more space is needed, continue on back)								

104.	NAME AND TITLE (Typed or Stamped)	SIGNATURE	DATE
APPROVING OFFICER	GILBERT M. McBRIDE, CH HSG DIV	<i>Gilbert M. McBride</i>	2 Jul 84
NAME AND LOCATION OF INSTALLATION HQ I CORP & FORT LEWIS, FORT LEWIS, WA			

DD FORM 1378

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NARRATIVE ON FAMILY HOUSING		REPORT CONTROL SYMBOL	
		DD I & A(A) 665	
1. MISSION Commands and operates Headquarters I Corps and Fort Lewis. Provides for the Command and Administration and Logistical Support for the I Corps Headquarters, Division and non-division units. Provides Logistical Support for the Madigan Army Medical Center and other tenant units.			
2. LOCATION Fort Lewis is located in Pierce County, eight miles southwest of the Tacoma City limits and ten miles northwest of Olympia City limits. Population within the commuting area is estimated at 640,227. Other statistics are: terrain - coastal rolling hills and valleys; climate - mild and wet; local economy - agriculture (truck, gardening, berries, bulbs, dairy products, etc.) and industrial (manufacturing marine and chemical products, wood by-products and harvesting of timber). Tacoma is a major seaport.			
3. COMMUNITY SUPPORT Approximately 12,500 military families and single personnel authorized payment of BAQ (Army and Air Force) reside off post and within commuting distance of Fort Lewis and McChord AFB, which is located six miles from this installation. Construction of new homes remains at a low level even though interest rates have dropped due to the large inventory of unsold homes (approximately 5,300 at time of survey). The lower interest rates now in effect still make it difficult for an E-5 and below to purchase a home. The supply of two bedroom furnished rental units is the most critical since they are needed for the enlisted grades E-1 through E-3 that are only authorized 225 lbs shipment of household goods.			
4. HOUSING ON POST There are 755 officer and 2,636 enlisted quarters at Fort Lewis for family use. This excludes three officers quarters diverted, one for use as DVQ (Lewis House) and two for bachelor O6 personnel identified as key and essential. Additionally, 124 officer quarters were temporarily redesignated as junior enlisted quarters. An additional 115 units are under construction with an approximate completion date of Sep 84. An additional 250 units are programmed under the 801 Program for FY86. Waiting periods for quarters at this time are: Field Grade Officers, 3 bedroom 2-3 months; 4 bedroom 3-5 months; Company Grade Officers, 2 bedroom 2-3 months; 3 bedroom 1-3 weeks; 4 bedroom 8-9 months; 5 bedroom indefinite; Senior Enlisted, 3 bedroom 6-7 months; Junior Enlisted, (continued)			
5. JUSTIFICATION OF PROPOSED HOUSING The attached DD Form 1378 indicates a shortage of 314 family quarters. At the present time, a total of 1282 enlisted applicants are on the waiting lists. The high number of personnel waiting for government quarters reflect the ever increasing rental, utility and transportation costs in the surrounding areas. The mission of Fort Lewis units require SM's to spend considerable time on field exercises varying from a few days to several months. These exercises require long separations from their families who are then isolated in the community. The families experience a transportation problem in their ability to utilize the post medical and other services. The SM must procure a second car, use public transportation that is not available in many areas, arrange a car pool or have the spouse drive the SM to work. This is not always possible. The spouses of many SM's do not drive and have difficulty in getting on post to use medical facilities, commissary and exchange. The SM's concern regarding their families welfare can affect their duty performance. Construction of additional housing units on post would allow SM's to leave their families on post, relieving concern regarding their welfare and will result in the SM's ability to concentrate fully on his military duty. When the VHA was instituted, there was not a significant drop in the waiting list for the above cited reasons.			
6. AUTHENTICATION	NAME AND TITLE (Typed or Stamped) GILBERT M. McBRIDE GM13 Chief, Housing Division	SIGNATURE 	DATE 5 Jun 84
7. NAME AND LOCATION OF INSTALLATION:			

DD FORM 1379
1 MAY 64

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

NARRATIVE ON FAMILY HOUSING, Item #4 (Continued):

2 bedroom 8-9 months; 3 bedroom 5-6 months; 4 bedroom 7-9 months. Very few rentals are available for less than a 6 month period. This makes it difficult for families with shorter waiting periods for quarters to find housing in the interim. Temporary housing is both scarce and expensive.

APPENDIX E

INFLATION AND RESIDUAL FACTORS

1.01 Inflation. Possible cost increases due to inflation during the period of analysis were not included in the itemized cost calculations. This is a constant dollar analysis. Adjustments were made, however, to escalate all costs to a midyear Fiscal Year (FY) 1986 price level. The inflation rates shown in table E-1 were used.

TABLE E-1
COST ESCALATION RATES

<u>Fiscal Year</u>	<u>Cost Escalation Rate (%)</u>
April 1983 - April 1984	5.47
April 1984 - April 1985	4.38
April 1985 - April 1986	4.83
Midyear 1983 - Midyear 1986	15.41
Midyear 1984 - Midyear 1986	9.42

Source: Department of the Army, Office of Comptroller, Budget Formulation Division, cited in EIRS Bulletin 84-01 (DAEN-ECE-S), for the Tri Service Military Construction Program (MCP) Index. Rate is from midyear to midyear.

2.01 Residual Factors. The residual value of a structure is the net disposal value of that structure at the end of the project life. The residual value of a structure is generally thought to decline over time, reflecting its use, consumption, or physical deterioration. A number of depreciation procedures can be used to account for this decline in value: straight-line, declining balance, sum of the year digits, and loan amortization (sinking fund method).

Following OCE direction, the loan amortization method was used to calculate the residual value of the MCA alternative. Residual factors applicable to this method are listed in table E-2. Initial construction cost was assumed to approximate new market value. Multiplying this amount by a selected residual factor^{1/} yields the estimated residual value (in FY 1986 prices) for the selected year.

TABLE E-2

RESIDUAL FACTORS

<u>Fiscal</u>	<u>MCA New Construction (40 year structural life (loan amortization))</u>
1986	1.0
1987	1.0
1988	.99
1989	.99
1990	.99
1991	.98
1992	.98
1993	.97
1994	.97
1995	.96
1996	.96
1997	.95
1998	.94
1999	.94
2000	.93
2001	.92
2002	.91
2003	.90
2004	.88
2005	.87

1/Factor reflects portion of principle remaining at the end of indicated year, for a loan amortization schedule of N years, at 10 percent interest. Assumed value declines beginning year in which all units completed (FY88).

Residual Value = Principal Amount x Factor
 = Principle Amount x (1 - amount of principle repaid)

$$\text{Factor} = \left[1 - \left(\left[\frac{[(1+i)^N] - 1}{i} \right] - \left[\frac{[(1+i)^n] - 1}{i} \right] \right) \right]$$

i = interest rate (.10), N = project life, n = year of depreciation (i.e., indicated year minus FY87).

END

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